APPLE'S SYSTEM 7.0: 70 SUPER POWER AND PERFORMANCE SECRETS

JUNE 1991
$2.95

MacUser

SNEAK PREVIEW:

System 7: Software Bargain of the Year

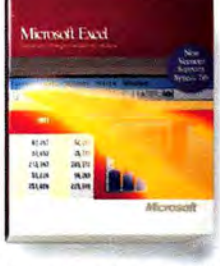
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- **PLUS:** Radius' Color Pivot, WordPerfect 2.0, file servers, and much more!



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Introducing Micros



Betsy Mill put it all in perspective when she wrote to us, "I love [Microsoft] Excel as much as my microwave oven but no love is perfect."

Well, Betsy, get a load of this. We think new Microsoft® Excel version 3.0 is the closest thing to perfection ever seen in a spreadsheet for the Mac®. For one good reason.

Power made easy.

The new Toolbar™, for instance, reduces common, time-consuming tasks down to one step.

Highlight a row or column of numbers, hit the Σ button (that's Autosum™), and *voilà* – it all adds up.

Do quick, push-button formatting.

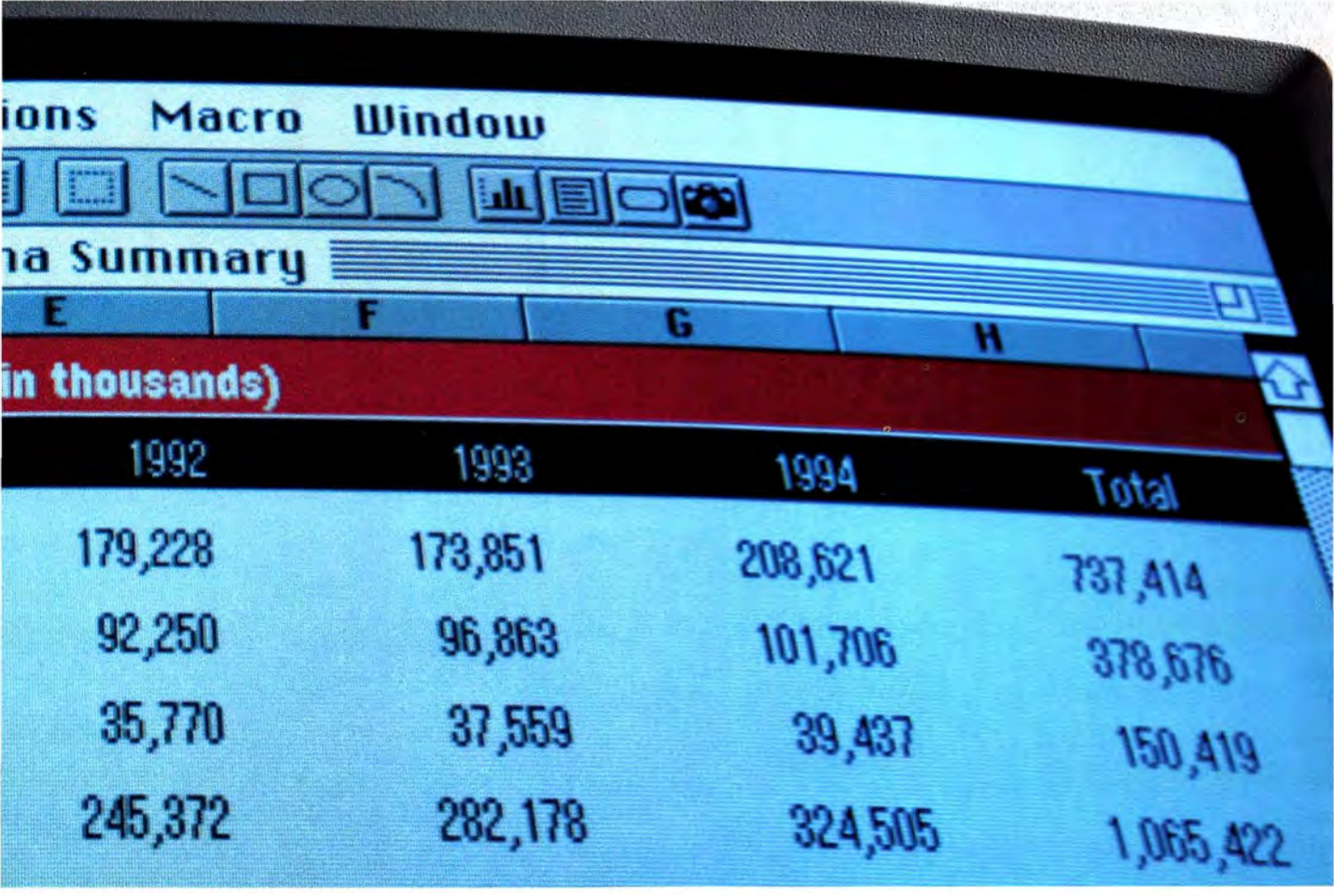
Use outlining features to collapse or expand worksheets without having to create multiple files.

As for charting, we took our cue from Paul Woods of St. Paul, Minnesota, who began his letter with the salutation, "Charts, charts, charts!" Hey, Paul – check out the picture for the full scoop.

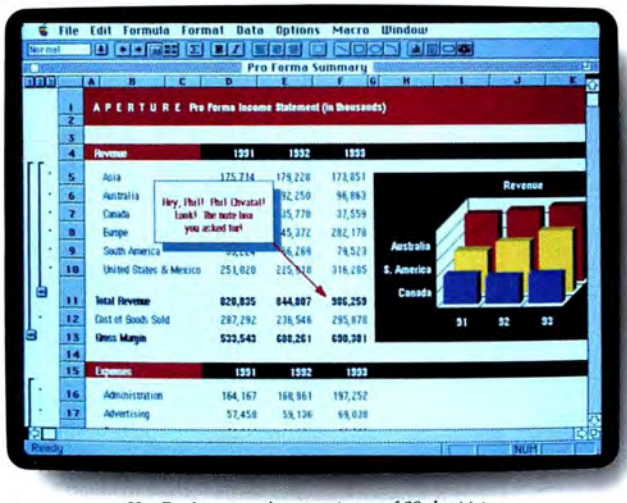
Did we mention that you can consolidate up to 255 worksheets at a time, regardless of format?

Or the feature called Goal Seek? Put in the total you want, and Microsoft Excel works backwards from there to fill in the variable you need.

*Plus shipping and handling and applicable sales tax. If you are a registered user of Microsoft Excel, watch your mailbox for an update coupon. Offer good only in the 50 United States. In the 50 United States, call (800) 541-1261, Dept. Q80. For sense are trademarks of Microsoft Corporation. Mac is a registered trademark of Apple Computer, Inc.



soft Excel version 3.0.



Yes, Paul, you can incorporate any of 68 chart types (24 of which are 3-D) right into your worksheet, along with text and data. And notice the outlining feature on the left? Go nuts.

Or the fact that this is the first System 7.0 application available?

We did fall short in one area, however, with Ralph Levy's cat. Here in Redmond, we're not very well-versed in how to remove cranky, sharp-clawed felines from atop user manuals.

Let the cat have your old manual, Ralph. You'll get a new one when you update your version of Microsoft Excel for $129 (or $50 if you acquired it on or after 12/7/90). Call (800) 541-1261, Dept. Q80, to find out more.

And by the way, Bryan Larson of Mission Viejo, California: we said hi to Bill for you. He sends his regards.

Microsoft
Making it all make sense™

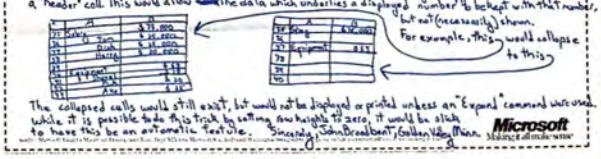
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We'd like to respond to your suggestions on how to improve Microsoft Excel.

9 out of 10 Mac spreadsheet users use Microsoft Excel. What are we doing wrong?

Tell us what's on your mind and it could end up on your screen.

"Collapsing Cells": Collapsing cells would be to a spreadsheet what outlining is to a word processor. A "collapse" command would allow a number of worksheet cells to essentially disappear and become part of a "header" cell. This would allow the data which underlies a displayed number to be kept with that number, but not (necessarily) shown.



The collapsed cells would still exist, but would not be displayed or printed unless an "Expand" command were used. While it is possible to do this trick by setting row heights to zero, it would be slick to have this be an automatic feature.

Sincerely, John Broadbent / Salem, Virginia

Microsoft
Making it all make sense

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Tell us what's on your mind and it could end up on your screen.

System 7.0 support

Sincerely,
Moni Rice

Microsoft
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Tell us what's on your mind and it could end up on your screen.

Incorporate a style sheet feature such as that used in MS Word - sometimes, more often than not, I like a format that has been set up and would like to copy it (look, stored and/or burned into a new document without recreating the cell style, attributes in spreadsheets.

Thanks for your ongoing efforts!!"

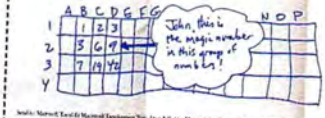
Elizabeth Fiedler
Durham, N.C.

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Tell us what's on your mind and it could end up on your screen.

How about being able to add notes on to the spreadsheet that have no effect on the cells. Example:



Thanx
Phil Chastel

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3D CHARTS

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Tell us what's on your mind and it could end up on your screen.

I'VE OFTEN SAID THAT IF ONLY MICROSOFT EXCEL WOULD AUTOMATICALLY WRAP WITHIN CELLS, I COULD DO 90% OF MY WORK IN MICROSOFT EXCEL. I'M AN ENGINEER WORKING ON THE SPACE STATION PROGRAM DESIGNING THE ONBOARD COMPUTER SYSTEM, AND MUCH OF MY JOB IS PRESENTING ENGINEERING DATA, WHICH INCLUDES BOTH NUMBERS AND OTHER PARAMETERS DESCRIBED IN THEORY.

Hope to see Listboards,
Wide Modal
Illustrated Excel, CD

Microsoft
Making it all make sense

9 out of 10 Mac spreadsheet users use Microsoft Excel. What are we doing wrong?

Tell us what's on your mind and it could end up on your screen.

Provide capability for What-If Analysis, so that once the dependent variable's final value is defined, it solves the level of the independent variables that will help achieve that result. The current method is the trial-and-error, which rarely exact and very inefficient.

Provide capability to integrate text, a portion of the spreadsheet and the graphs, ie. integrated text and graphics to automatically prepare a presentation ready copy.

I look forward to seeing these capabilities in Microsoft Excel soon.

Sincerely,
Rajendra Sehsaria
Chicago

Microsoft
Making it all make sense

9 out of 10 Mac spreadsheet users use Microsoft Excel. What are we doing wrong?

Tell us what's on your mind and it could end up on your screen.

BETTER CHARTING FEATURES.
3D CHARTS
DRAWING TOOLS?
THANKS

DON GAUTHIER

Microsoft
Making it all make sense

MacUser

JUNE 1991

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Cover photo by Pierre-Yves Goavec



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System 7.0 will put the soul of a new machine into your Mac.

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Palmtop scheduler or Mac peripheral — or both?

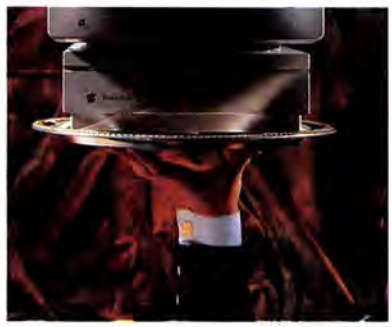




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The best Mac file server may not be a Mac.

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70 Things You Need to Know About System 7.0

BY CRAIG DANULOFF AND AILEEN ABERNATHY

The best software bargain of the year — System 7.0 — is almost here. The Mac's new operating system will transform nearly every aspect of working with a Mac. Right off the bat, you'll love the reorganized System Folder, balloon help, TrueType, and a Find command that not only finds but also fetches. This in-depth guided tour of System 7.0's features explains them all. **96**

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BY DARRYL LEWIS

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BY JOHN RIZZO AND THE MACUSER LABS STAFF

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MacUser LABS Mac, DOS, and VAX File Servers

BY DAVID BEAVER, TIM STANDING, AND THE MACUSER LABS STAFF

Your file-server options are both exciting and bewildering. MacUser Labs tests eight powerful hardware and software setups, ranging from Mac to VAX, from UNIX to NetWare. **134**

MacUser LABS CD-ROM Drives: Is It Time for CD-ROM?

BY RIK MYSLEWSKI AND THE MACUSER LABS STAFF

Buy any of the 16 CD-ROM drives MacUser Labs tested, and you open the door to an incredible world in which hundreds of megabytes of fonts, data, and applications are right at your fingertips. With list prices for CD-ROM drives starting at less than $700, the time to choose a CD-ROM drive is now. **150**

Silver Platters That Matter

BY THE EDITORS OF *MACUSER*

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"Apple says that Mac users who install System 7.0 'will have practically a new machine.'" **96**

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CalenDAr: Appointment and reminder software with great sound-recording features. **DisplayServer II-DPD:** A display card that lets you use VGA or multiscan monitors with your Mac. **SnapJot:** Screen-capture software that's versatile and easy to use. **For the Record:** Personal record-keeping software with sophisticated analysis functions. **Studio Vision:** Recording software for both digital audio and analog sound. **Oids:** Adrenalin-pumping arcade-game challenges await you! 89

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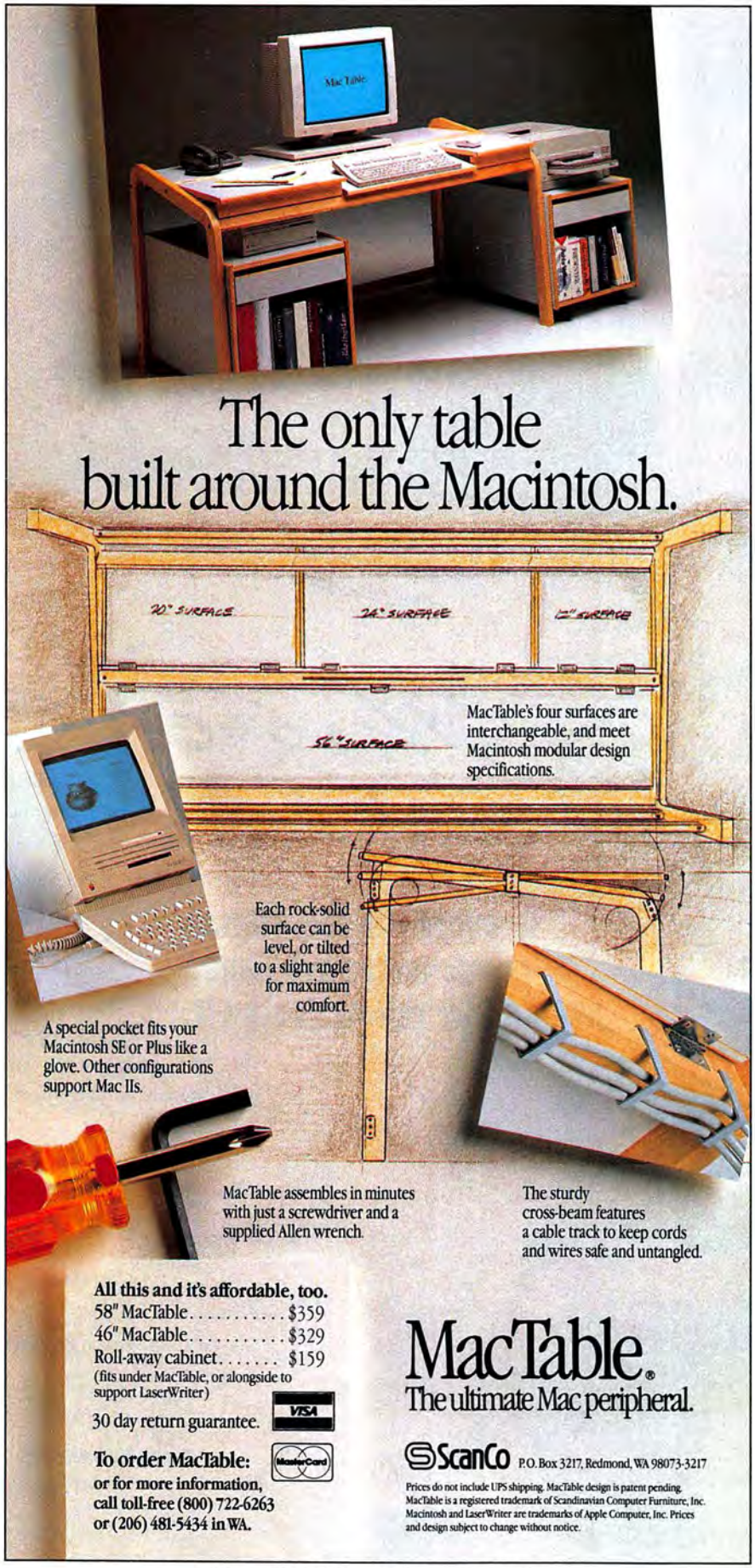
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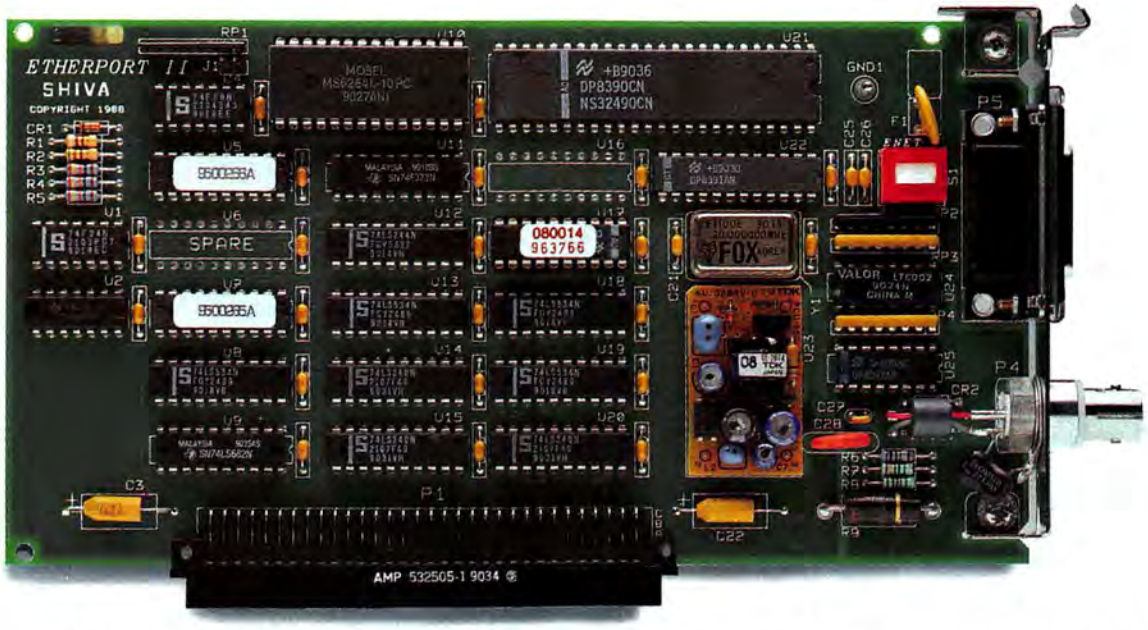
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MACWORLD, MAY, 1991

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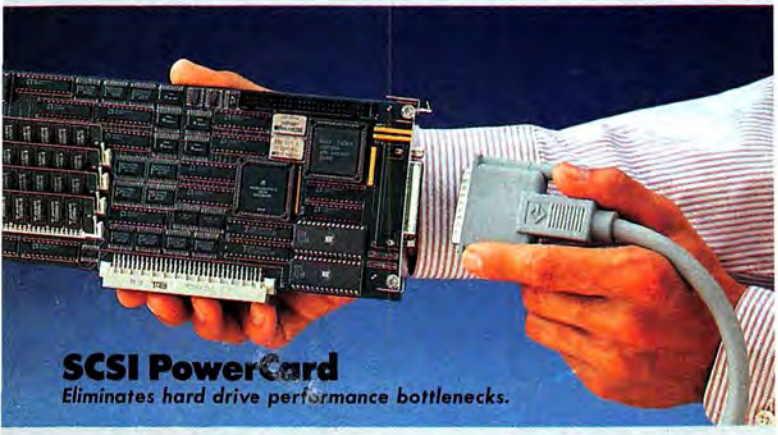
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About MacUser

Testing, Testing . . .

Each year MacUser Labs tests upward of 600 products. This translates into several tons of computer hardware that must be logged in, set up, tested, retested, and shipped out again, leaving behind a fat paper trail of test results and technicians' notes. And one staffer is the point man delivering the results to you: Rik Myslewski (pronounced Mish-*leff*-ski).

Rik, a hardware kind of guy, wouldn't say, "Software's for wimps" but allows, "I like judging hardware because I'm dealing in facts. Evaluating software always has a subjective element."

As senior editor for MacUser Labs, Rik ensures that those facts are accurate, timely, and relevant to a broad range of business buyers. Sometimes he's forced to rein in the enthusiasm of our resident technologists to make sure that every project — and every detail of every project — conforms to these standards.



Poised at the pivot of MacUser Labs and MacUser Edit, senior editor Rik Myslewski strives to produce balanced lab reports.

The process of making it all relevant starts with choosing the appropriate sets of products for testing, continues with designing the particular tests for the project, and culminates in producing a lucid report — one that readers can use to make practical buying decisions. "We give buyers the information they need in a form they can understand." You can see the results in this month's lab reports, which include one Rik wrote himself on one of his areas of interest — CD-ROM drives.

Sometimes making things relevant means sparing readers fascinating information that doesn't really aid buying decisions. Sometimes you don't know a test is redundant until after you've done it. Recently Rik dropped a dot-gain test from a report on color PostScript printers when the results proved redundant for the test of overall perceivable image quality.

Rik looks for ways to improve the lab-report format as well. A while ago, he introduced an overall rating for products. In the past, lab reports had simply documented the results of several tests. Now the results are weighted and then normalized, codified, and combined into an overall rating for the products.

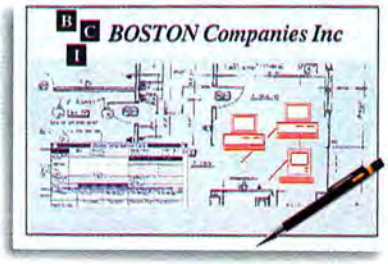
Timeliness comes right after relevance in importance. Rik is the guy who reported on the new low-end Macs when they were introduced. He's always down in Cupertino, eyeballing Apple's latest and greatest, as well as looking at the less renowned efforts of other vendors. "I see products when they're on a workbench in a cardboard case, with wire-wrap boards and duct-tape fasteners. I've seen more system crashes than anyone I know."

Of course, the reviews department gets first crack at telling you about the hottest new products — such as the Radius Color Pivot featured on this month's cover — but Rik will get the last word when we run our next color-monitor lab. For now, Rik's getting to know the Color Pivot better. He's got one on his desk.

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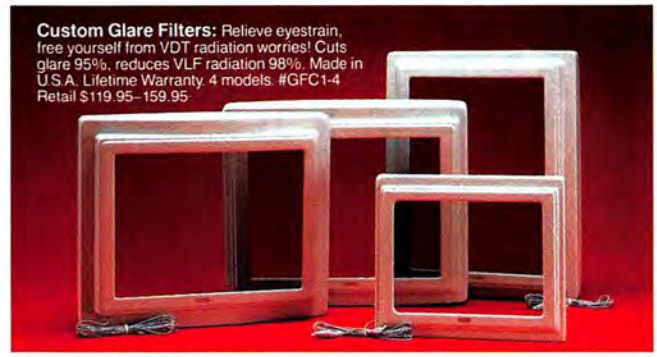
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LETTERS



Mark Alberhasky, of Bowling Green, Kentucky, recently had a fling in the wild and wacky world of IBM PCs. He manages a Mac network, but he decided to do the slides for a formal presentation on a colleague's new PC. The system included Microsoft's PowerPoint software, Windows 3.0, and a film recorder. Everything worked fine until he tried to send his prepared images to the film recorder — and couldn't. Microsoft hadn't provided the needed Windows driver.

The IBM store rep came over and spent many fruitless hours talking to tech-support people and fiddling with the system. He finally exclaimed, "Gee, this is frustrating. We've been making slides on the Mac for years."

✉ *Write to Letters to the Editor, c/o* MacUser, *950 Tower Lane, 18th Floor, Foster City, CA 94404, or post your letter on the MacUser Forum of Zmac, our on-line service.*

All letters become the property of MacUser, *and we reserve the right to edit any letters we print. Please include a return address and a daytime phone number.*

Shareware and Tear

I was interested in the shareware products discussed in "Best-Buy Bargain Word Processors" (January '91, page 156). After looking at a few of them, I decided I liked MyWord 0.52 best. Contrary to what the article says, however, MyWord 0.52 isn't free but is IYUIPCS (if you use it please contribute something).

Also, you didn't mention one *absolutely free* product: Leonard Rosenthol's ΣEdit 1.11. This is a fairly sophisticated word processor — it even features power keys — although it doesn't automatically wrap text. And the next version will include many additional features, such as wraparound searches and aligned text.

John B. Thoo
Davis, CA

No Fool Like an April Fool

For the past year, my firm has used a dead DataFrame 20 (from SuperMac Technology) as a paperweight. After reading Thom Hogan's article ("The Expert's Pledge," April '91, page 235), I decided to give the hard drive "the Pledge treatment." Guess what? It worked!

I realize that neither *MacUser* nor Mr. Hogan can be held responsible for his rather unorthodox repair treatment. However, you both deserve a ton of credit. (By the way, peanut butter *does* make a mouse grip the pad better, but it's awfully messy.)

John R. Grizz Deal
Los Alamos, NM

George Washington Carver would be proud of you. We're glad you enjoyed Thom's April Fools' advice — just don't scare us like that again! (Keep the Lemon Pledge on your furniture, where it belongs.) — JB

Correct the Dots

I eagerly opened my new *MacUser* to the hard-drive lab report ("Life Begins at 40 Megabytes: Small Hard Drives," April '91, Buyer's Guide page 4). Looking at the features table, I noticed that according to the legend, open circles mean Yes and solid black circles mean No.

Or do they?

In other features tables in the magazine, the legends state that solid black circles mean Yes and open ones No. What is up?

Celia Comstock
Garberville, CA

You certainly know how to eye your dots. The legend in Table 2 of the article you cite is indeed backward. Always and everywhere in MacUser, *open circles are supposed to mean No and solid circles Yes. — JB*

Dear Mr. Sculley . . .

In March we thought Mr. Sculley should see *MacUser* readers' wish lists for the next low-cost product from Apple. Surprisingly enough, those wish lists by and large stayed in the realm of the possible.

Konrad C. Schafer, Jr., of Hatboro, Pennsylvania, requests a less expensive full-page monitor. He believes that "at $500 for a low-end full-page monitor, many people just make do with their standard 512 x 342 or 640 x 480 screens. I'd like to see an external full-page screen for $250 to $300 for both the Mac II and compact lines." He reasons that the use of full-page monitors can help fight consumption of paper, because drafts of documents can be more easily viewed on-screen instead of having to be printed out each time. "Although the 'paperless office' may be decades away, the 'less-paper office' could be here now."

Another reader, D. Vernon (no address), would like a "24-pin dot-matrix or inkjet printer in the $500 range and a basic, 'Classic' if you will, laser printer in the $750 – $1,000 range. And in the name of all that's holy, let the new printers do envelopes! My current rate is ten wasted to one printed whenever I foolishly try to print an envelope with my ImageWriter." Judging by last month's cover story on the StyleWriter and Personal LaserWriter LS printers, Apple was thinking along the same lines.

All Wade H. Van Buskirk, of Mendocino, California, wants is "more power for less money. This is the overall trend for personal computers and the electronics industry as a whole." And he doesn't mind if other companies share the burden of rolling out the low-cost products we want. "I think the next bargain will be a Mac/Sony portable with a low-power 68030 chip. The bargain may not be at Apple Computer. It may be at Sony Corp. Can you say, 'Sony Mac Walkman' for two million dollars? What a bargain!"

Last year Apple reabsorbed its Claris spin-off and went back into the application-software business. Now what direction should that business take? Apple could have Claris stick to expanding and improving its current Mac software line. Or it could tackle the interoperability issue that still makes Macs stick in many a corporate MIS throat.

Speak Up:

Should Apple have Claris bring out Windows versions of its product line?

✉ *Send your thoughts to Dear Mr. Sculley, c/o* MacUser, *950 Tower Lane, 18th Floor, Foster City, CA 94404.*



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LETTERS

Pardon Our French

In "Putting Your Business on the Map" (March '91, page 158), Jeffrey Steinberg reveals his dreadful command of French. He says, "Descartes [the product], named for the famous French mathematician René Descartes" *Au contraire.* The French term *des cartes* means, literally, "the maps." Because the program in question is a geographic database and mapping program, not a math package, it is clear which meaning the program's authors intended.

I recommend that *MacUser*'s editors forcibly change the System on Mr. Steinberg's Mac to F1-6.0.4, the French version, available on Apple's A Disc Called Wanda CD-ROM.

Stephen Lardieri
Princeton, NJ

Le nom Descartes pour le produit est un double entendre nommé après l' homme et *le terme — l' homme parce qu' il a écrit à propos de l' importance de méthode en poursuite de savoir et du plaisir de découvrir. — LT*

Teachers' Aid

Dale Hill's letter (March '91, page 20) advocated Macs for teachers. I agree. And with so many teachers being paid so little, how many of them can afford a Mac (or any computer), even at current prices, even with the educator's discount?

Apple would reap a public-relations harvest by supplying Macs (even with a minimal handling cost) to low-income teachers. Couldn't Apple and some software vendors unite to provide a Classic or LC and, say, T/Maker's SmartBundle or even Microsoft Works? Giving a tax break to participating vendors would help too.

Doug Hinschberger
Eatonville, WA

John Sculley isn't exactly Mother Teresa, but Apple does have an altruistic streak. See Guy Kawasaki's column in this issue for details. — LT

Happy Together

My first issue of *MacUser* (March '91) was informative and useful. I was impressed by the mature and thoughtful reactions of your columnists to MS-DOS computing and to Windows. The one exception was Mr. Kawasaki's unnecessary remark that Windows developers should go to Hell.

As for the quandary of developers that Kawasaki discussed, why can't they develop software for both platforms? I use my IBM PC clone with MacInTax for Windows, Excel, and Adobe Type Manager — all developed originally on the Mac. If a product fits a need, it will sell. Windows will have no lack of business applications, but there are many niches still unfilled. Likewise, the Mac lacks some high-powered applications that are currently available only for PCs.

I'm glad to see that the industry is finally talking and working together to improve computing for all of us — now that sounds like a great motto.

Stephen Conklan
Centreville, AL

Lost at C

Jon Zilber is one of the few Mac enthusiasts who recognizes that the personal computer was not invented in 1984. However, even he has not traced the true origins of some long-lasting computer traditions.

In "Myth Communication" (March '91, page 25), he remarks, "You have to love those Microsoft ads that proclaim that now there's finally an alternative to the C-prompt. Just who do they think foisted the C-prompt on the world in the first place?"

Actually, the C-prompt existed long before anyone had heard of the IBM PC. It comes from Digital Research's CP/M, a popular operating system of the '70s. CP/M assigned letters to disk drives: A and B were reserved for floppy drives, and C was for the rare hard drive.

The C-prompt was born in 1981, when IBM brought out its PC. IBM looked to Microsoft for an operating system, and Microsoft simply copied the "user interface" that people of the day already knew.

Stephen Lardieri
Princeton, NJ

Foisted by my own petard? I never wrote that Microsoft invented the C-prompt. Webster's Ninth New Collegiate Dictionary *provides as one definition of* foist: *"To pass off as genuine or worthy <~ costly and valueless products on the public . . .>." If you think that these are harsh words for describing DOS, see the next letter. — JZ*

Don't Do Windows

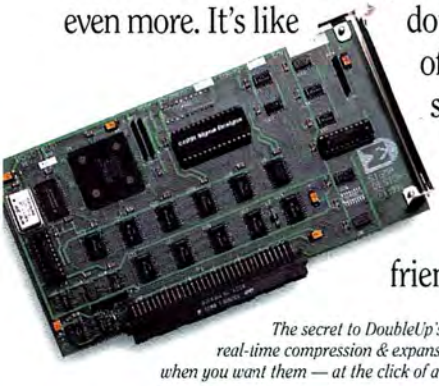
Robert Wiggins' column "The Perfect Portable" (March '91, page 29) contains a nugget of wisdom that — received in your pages and elsewhere — has cost me more time, money, and irritation than I could ever afford, to wit: Windows "sure makes using a DOS laptop a lot easier and opens up the laptop world to many Mac users



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who don't want to learn DOS."

That's me to a T. I just need portability and IBM compatibility for client systems, not an education.

I was given to understand that Word for Windows would require few adjustments for Mac Word users. *MacUser* also assured me that translation between systems was easy — see your glowing review of Software Bridge for the Mac and Word for Word/Mac (March '91, page 68).

So off I went.

Nobody mentioned that you install software with DOS. Nobody reminded me that you quickly get lost in the DOS directory/file/path hierarchy and nonsense file names (WACKNBSH.431). Worst of all, when something weird happens, you need to know basic DOS to fix it. And I defy any layman to find anything basic — or useful — in a DOS manual.

I know, a real computer person could figure it out. But I bought into the Mac approach to make the computer serve as a tool, not as a big, specialized job unto itself.

I'm not whining, but I do plan to scrap Windows and Word. I will not complicate my life with time-wasting, wretched imitations of the Mac. A hog wearing makeup still stinks.

Ralph W. Tucker
Brooklyn, NY

That Old-Time Religion

Once again a Macintosh publication pooh-poohs Windows 3.0. Jon Zilber, in his "Myth Communication" column (March '91, page 25), tries to dispel the "myth" that Win3 means trouble for the Mac. Well, Jon is right when he writes that Win3 is no match for the mature Mac interface, but Win3 still spells big trouble for Apple.

In the early days, Apple's counterpunch to DOS' dominance was Mac evangelism, a.k.a. religion. DOS countered with ignorance induced by MIS obfuscation and Apple's pitiful marketing (in Canada at least). Now DOS-heads have Win3, ignorance, *and* religion — their version of the original 128K Mac.

I'm afraid that the new cheap Macs are too little, too late. The overwhelming weight of PC clones and Win3 will relegate Apple to permanent niche-market status or oblivion.

All this because no one at Apple would listen to us; to the press; or, so it seems, to the many brave techies within Apple who ignored the cretins in suits and secretly continued clandestine development of affordable Macs.

Paul Chato
Toronto, Ontario
Canada

They may well have religion, but what good will it do them without Guy Kawasaki? — JB

Two Confused

I'm confused. In your MiniFinders section (February '91, page 329) you describe Persuasion as "the premier desktop-presentation program." But in "The 6th Annual Editors' Choice Awards" (March '91, page 100), you list MORE 3.0 as the best presentation product. Persuasion doesn't even get an honorable mention.

Robert R. Wallace
Salt Lake City, UT

Our Editors' Choice Awards (the Eddies) honored the top products of 1990. Persuasion 2.0 didn't appear because it came out in 1989. In fact it received an Eddy nomination that year. — AA

The latest set of Eddy awards left me mystified. Is there some particular reason why the editors decided not to award an Eddy for best word-processing program? More than ever, with the exception of Microsoft, companies are concentrating on innovative products.

Spreadsheet programs were also left out of the mix. Clumping them in with database programs makes no sense, purely in terms of market impact. Why on earth didn't you have separate categories for painting and drawing programs, considering that color prepress and 3-D modeling qualified for separate categories?

Paul Lane
Ames, IA

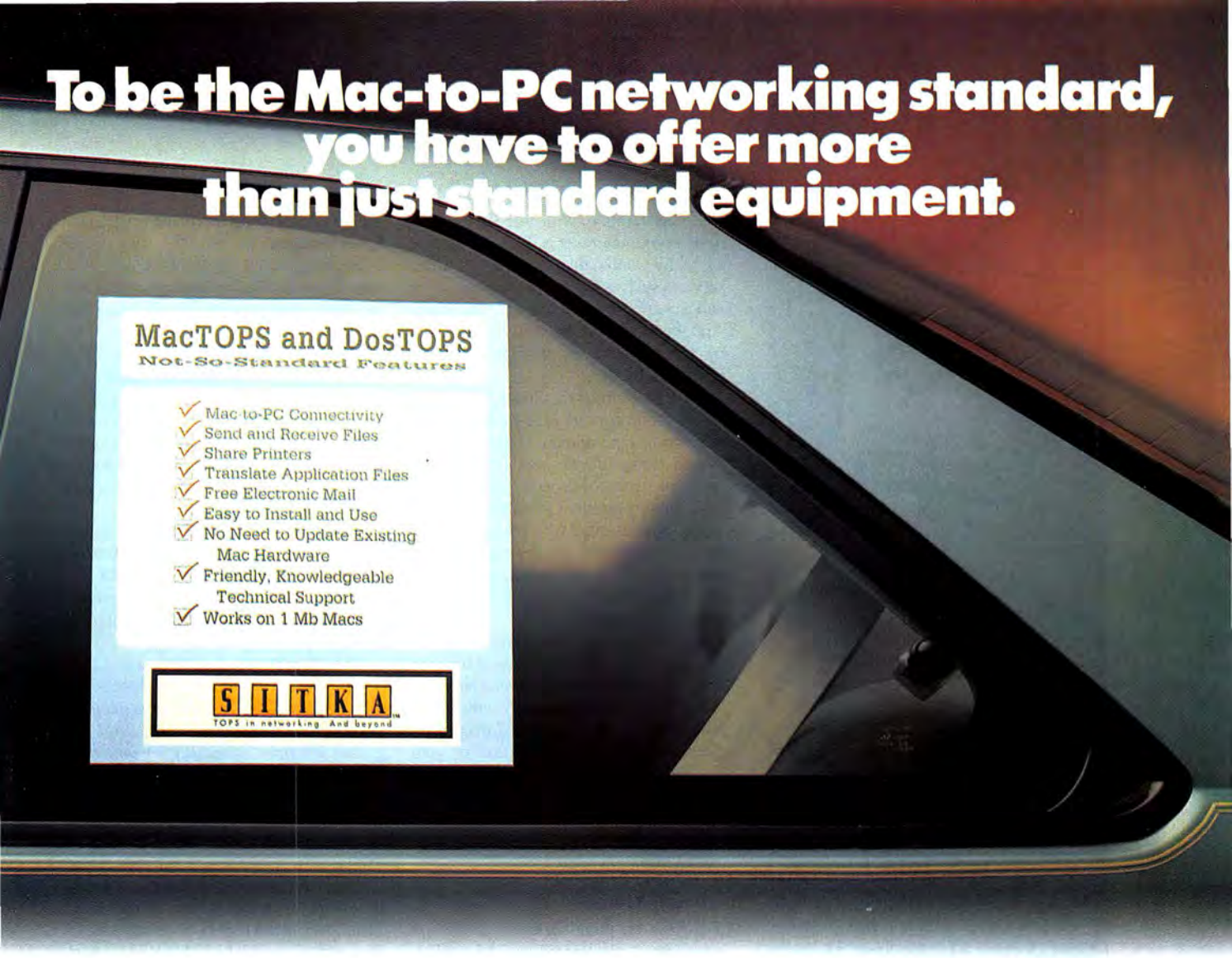
We have chosen to honor the most important new products each year with our Eddies, and we let the categories float. This isn't neat organizationally, but it ensures that all the products we honor are ones that merit your particular attention. — LT

Money Talks

Your review of Mac front ends for CompuServe ("Navigator and CIM," March '91, page 62) was not exactly balanced. Yes, the Information Manager package is somewhat clumsy, but on the other hand, CIM costs $10 (after rebates), compared with $100 for the more elegant Navigator.

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aren't as familiar with telecommunications as your reviewer is. We aren't sure if we really want to throw money at on-line services such as CompuServe until we've had a chance to try one out for ourselves. And we would be promptly discouraged by CompuServe in straight terminal-emulation mode.

As I sit writing this letter, I'm using CIM off-line in a very Mac-familiar word-processing environment. I just received — via CompuServe — a fast, helpful, response from Microsoft tech support concerning a problem I was experiencing while trying to send MS Word 4.0 documents. (I had Smart Quotes turned on and was transmitting *U*s instead of apostrophes). Right now I feel that my ten bucks were well invested.

CIM isn't elegant, but it offers a cheap and fairly friendly way for neophytes to find their way through unfamiliar territory. Why compare it unfavorably with an application costing an order of magnitude more, when a great proportion of your readership is just beginning to wonder what on-line services have to offer?

Simon Hanmer
Ottawa, Ontario
Canada

Paper Training

Shame on you! An entire article on laser paper ("The Paper Trail," March '91, page 181) and no mention of recycled paper or recycling paper.

I fill my LaserWriter with used paper printed on one side. When I want to print a "final," I manually feed the good paper. All discarded proofs are recycled or given to friends' children to color on.

Obviously there will be instances in which the current supplies of recycled paper will be too limited or too expensive for a specific job, but the more people demand recycled paper, the sooner the industry will respond with better selection and lower prices.

Sharon Steuer
Bethany, CT

PostScript Postscript

I had a few thoughts about your PostScript-printer lab report ("Personal PostScript Printers," March '91, page 116). First, the footprint chart on page 120 is a good idea, but the QMS and HP footprints are actually smaller than that of the Apple Personal LaserWriter NT when you buy their paper cassettes so you don't have to fold out the tray. And even with the option, their total cost is still less than the Personal LaserWriter NT's.

Second, I would have liked to see the speed benchmark chart show performance with and without a hard drive attached (for the printers that offer this option).

Third, I wish you had addressed noise level. There are significant differences here. The NEC is quite loud, the Apple is quieter but still noisy, the GCC is noisy when printing but quiets to a sleep mode during long periods of inactivity, and the HP is the quietest of these four. I don't know about the others.

Finally, I wish you had also reviewed the HP LaserJet III. I know, it stretches the "personal" definition a bit. But it doesn't cost much more than the priciest printer you reviewed and should have better print quality.

Scott Harris
Mt. Kisco, NY

It would be nice to test all the printers with all their options, including RAM upgrades and hard drives. But it would take months, and you would have had to wait until September to read the lab report. And when you attach a hard drive to a printer, access to disk fonts is just about as fast as access to ROM fonts. Either the fonts are already in the printer's memory, or you test how long it takes to download them to the printer. Downloading them to the printer would be a bit slower than downloading them to RAM, but it would be a one-time process.

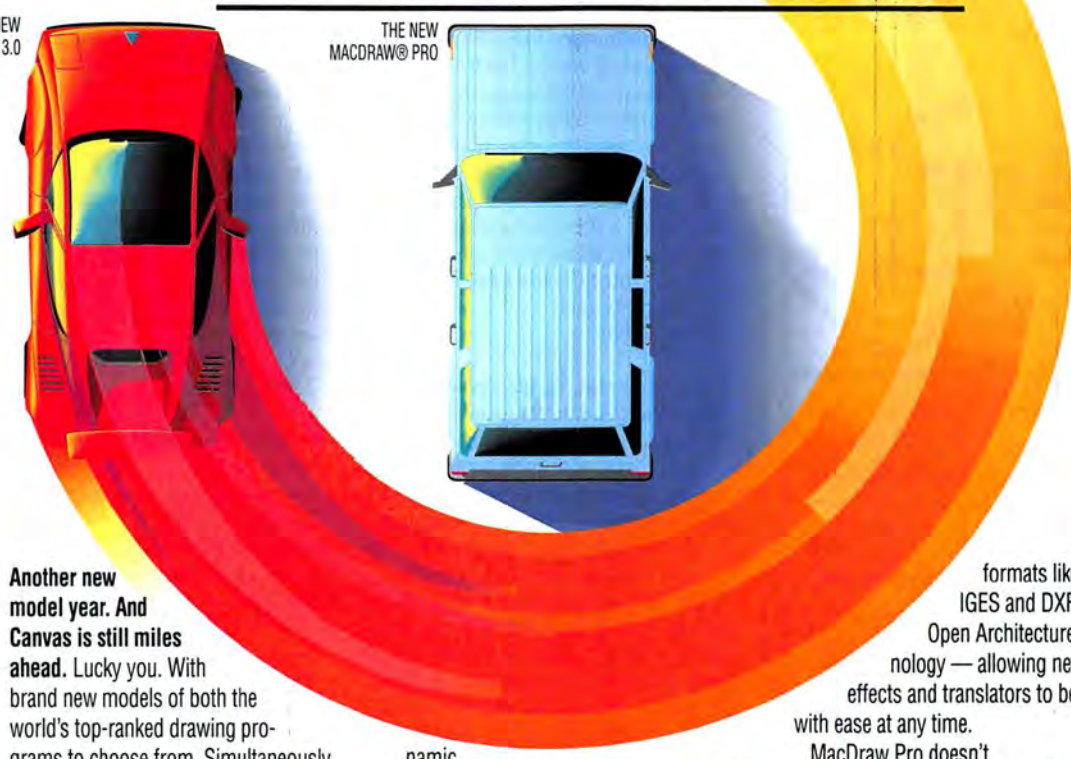
We didn't run noise tests, but if any of the printers had been really loud, we would have commented on that in the text.

The HP LaserJet III was omitted purely because of price. You have to draw the line somewhere. — BF

FileBusters

I take exception to Ben Templin's claim that FileMaker Pro is "the best flat-file manager available for the Mac" (March '91, page 44). I recently acquired the flat-file-database program Panorama (ProVue Development Corp., Huntington Beach, California). Panorama is easy to use — I had it up and running in minutes — powerful, and swift, and it uses far less disk space and costs less than FileMaker Pro. It has most of the features touted in your FileMaker Pro review. In addition, Panorama offers data viewing in spreadsheet format, charting and graphing, "clairvoyance" (the program fills in previously entered values as you type), FlashArt for layouts and charts, use of

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MacDraw Pro doesn't.

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4½ MacUser, 9/90

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paragraphs and equations to create form letters, automatic phone dialing, and the ability to play sounds in macros and when viewing records.

What's the catch? Well, Panorama lacks layers (big deal), uses 8 colors instead of 81 (hey, I print to a LaserWriter), and isn't designed for network use.

For typical users, Panorama is the flat-file manager of choice. I didn't even have to beta-test it, as all you poor FileMaker Pro users have had to. And yes, I have also used FileMaker Pro. It is moderately difficult to learn and is *incredibly* slow on an SE. So come on, *MacUser*, stop praising this dud of a program and instead offer sympathy to those users of networked databases forced to use FileMaker Pro.

Gregory Tetrault
Omaha, NE

Ben Templin, in his review of FileMaker Pro (March '91, page 44), writes, "Even with its problems, FileMaker Pro is still the best flat-file manager available for the Mac." However, I have experienced too many crashes and file corruptions to use the current version. It's way too slow as well — even on my IIci.

The cavalier attitude "Well, it works *most* of the time" doesn't cut it in a serious business environment. I could, by the way, apply these same remarks to Microsoft Excel 2.2a and others. At least with FileMaker, Claris is willing to acknowledge the problems. Microsoft just says, "Check your Mac configuration" or some such.

FileMaker Pro is a great program otherwise, and Claris seems to be trying hard to get it together.

Jack Holland
Ridgecrest, CA

Many FileMaker Pro users' problems stem from faulty conversions of their FileMaker II databases. Look at "12 FileMaker Pro Tips" (April '91, page 224). Or you can download the tips from Zmac, MacUser*'s on-line service. The filename is FMPRO.TXT, and you can find it in Library 7 (Reference) of the Download & Support Forum (GO ZMC:DOWNLOAD). — BT*

Defending Timeslips

I want to take issue with your review of Timeslips III (February '91, page 80).

The reviewer says that "the program conflicted with other Mac functions that used the serial ports or clock" and that he "also experienced a notable increase in system crashes." These statements are likely to make many readers shy away from a program that offers tremendous tangible benefits.

Your reviewer may have encountered problems in running TSTimer on his particular system, but we have been using TSTimer as our sole means of tracking time and expenses for two years, and during this period, TSTimer has never caused printing problems or system crashes. In fact, since we upgraded to Timeslips 2.0b, we have encountered no Timeslips-related system problems or conflicts with other applications.

Your review also complains about the difficulty of setup and how confusing it is to determine whether a slip is running or not. True, it is a pain for a nonaccountant to set up, but it's absurdly easy to use. You create a new time slip, for example, by opening TSTimer and selecting New Timeslip from the Timeslips menu. At this point, if you don't have time to enter all the information (say, if you've just received a call from a client), you just click on the Turn On button. You can enter the remaining information later. It is equally simple to determine whether you have any time slips running and to go directly to a slip that is.

I don't think Timeslips is perfect by any means — but I do think that it can be an incredibly valuable tool. As soon as we started to use it, we started to bill more dollars every month. For this, Timeslips has my undying gratitude.

David Orgel
Arlington, VA

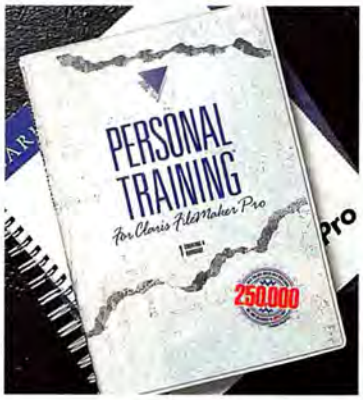
Usually the straw that breaks the camel's back is the last one you installed, but not always. Although our reviewer's previously stable Mac system began crashing just after he installed Timeslips III, further testing has shown that Timeslips was not the culprit. We're also pleased to note that version 2.0f now provides a warning when the Mac is shut down while a slip is still running. Consequently, we have raised Timeslips III's rating to four mice. In addition, Timeslips has recently enhanced its product with two new add-ons: TSImport, a utility that reads data from such diverse sources as fax and copier monitors, Sharp's hand-held Wizard, bar-code readers, and telephone accounting systems; and Timeslips III Accounting Link for the Mac, which automatically transfers data into several popular accounting packages from Timeslips III. Watch for a review of these new Timeslips capabilities in an upcoming issue. — JZ

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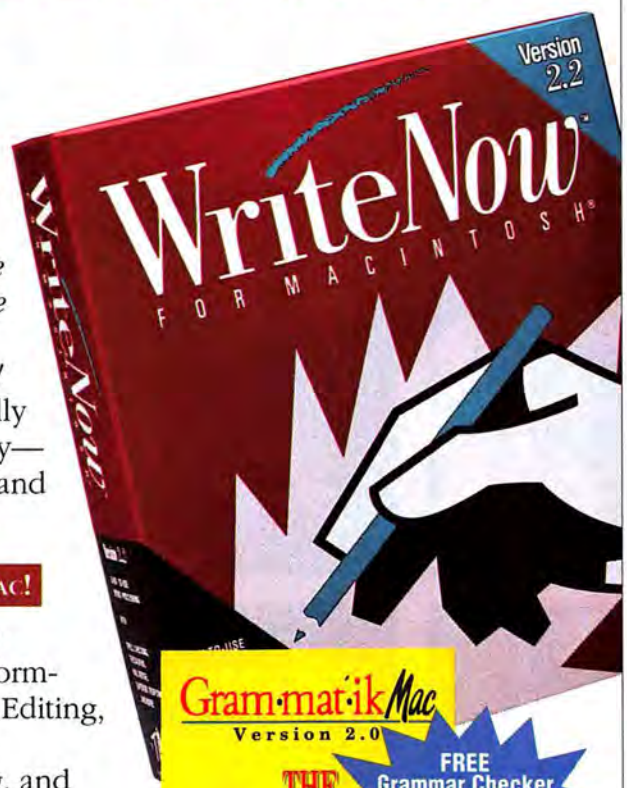
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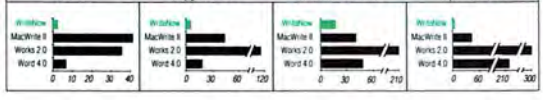
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Grammar Checker *(Bundled)*:	Yes	No	No	No
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Flauting Our Ignorance?

Your review of The Magic Flute Audio Notes (November '90, page 88) was excellent, but Mozart's last opera was not *The Magic Flute* as stated. Mozart's operatic swan song goes by the name *La Clemenza di Tito* (*The Clemency of Titus*), and it was sadly, in Mozart's day, a flop.

David Trainer
Sydney, Australia

Mozart was a true multitasking composer: He interrupted his work on The Magic Flute *to write* La Clemenza, *and the former premiered after the latter. So which came last — the one he started last or the one he finished last? — JB*

OOPs

In the February '91 Power Programming column (page 303), you seem to confuse the features of object-oriented programming (OOP) and event-driven programming.

A *program* is *event-driven* if most of the code passively waits to be triggered by events such as mouse movements and key presses. A *language* is *object-oriented* if it lets you encapsulate data with routines for manipulating it.

To exploit the Mac's graphical user interface, programs must be event-driven. OOP, in turn, can simplify event-driven-software design, because events can be implemented as messages to objects.

J. Thomas Ngo
Cambridge, MA

The Last Word

Re "Apple Events" by John C. Dvorak (February '91, page 400): Jeez, Dvorak, what a sourball! Keep 'em coming.

Doug Allaire
Iowa City, IA

Clarifications

In the April review of Intouch (page 60), the price should have been $69.95, and the phone numbers for Advanced Software should have been (800) 346-5392 and (408) 733-0745. Also, the Snapshot-button feature actually creates a new record and then pastes the contents of the Clipboard into the address field of the new record.

In the same issue, the MacAvenue phone number in "Life Begins at 40 Megabytes: Small Hard Drives" (Buyer's Guide page 28) should have been (800) 888-6221.

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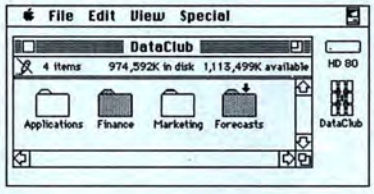
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Unlimited scalability	Thanks to its Virtual Server technology, an expanding DataClub network retains its simplicity and actually grows more powerful.	As peer-to-peer systems like TOPS grow, they become more and more unmanageable.
Add users without reconfiguring	DataClub automatically reconfigures the network whenever hardware is added or removed.	On a TOPS network, users have to mount volumes manually every time a new user or disk is added.
Centralized backup	You can back up a DataClub network quickly, easily, and more often – because all shared information can be backed up from any Mac, at any time, without interruption to the system.	By contrast, TOPS requires individual back up of each node.
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Phillip Robinson
San Jose Mercury News



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JON ZILBER

The Upwardly Mobile Mac



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Come in. Make yourself comfortable. No, you don't have to lie down on the couch. Just relax. We're here today to cure your hardware anxiety. Now then, the first thing we're going to do is a quick word-association test. What's the very first thing that pops into your head when you hear the word . . .

Miniature.

If you're involved with desktop computers or workstations, you probably immediately thought of notebook computers. If you thought of golf or cute little porcelain figurines, put this magazine down and go pick up a copy of *HummelUser* while the rest of us try another word . . .

Mobile.

If *that* didn't make you think of notebook computers, you probably come from Alabama — or maybe you live in a trailer park. Or perhaps —

Ahh! *That's* the problem: You use a Mac. All the people who do lie down on the couch talk about nothing but notebook computers. Even when they're recounting tales at a party about how they met their wife or their ex-boyfriend, the conversations no longer start out with somebody asking somebody

"What's your sign?"

"Who's your broker?"

"What's your favorite font?"

These days, all those conversations start out with the icebreaker for the '90s:

"Sooooo . . . what's *your* notebook weigh?"

Except for Mac people, that is; *they* never ask that particular question.

The Cure for Notebook Envy

Miniaturization and mobility are changing interpersonal communications — not the kind that psychoanalysts deal with but the productive kind of data exchange that notebook and palmtop computers help make possible — and even pleasurable.

Miniaturization is more than merely making things smaller. Less obvious is the difficulty of designing small things so they can still be used by human beings. This means harnessing no-brainer input modes such as gestures and speech.

And mobility is not quite as simple as putting a carrying handle onto a lightweight box. Certainly, making a computer mobile means making it carryable — which means it must be lightweight, have a convenient form factor, be nonhazardous, and so on. But it also means, ideally, that you can use the mobile machine to access your deskbound network, from anywhere in the world.

So how do you do that?

One way is to build in physical, interactive links between a palmtop computer and your earthbound machine; that's the state of the art today (see "Data on the Run," elsewhere in this issue).

Another neat trick is what's called deferred input/output (I/O). You're already well acquainted with deferred I/O if you caught our story on the GO tablet-computer operating system in our March '91 issue ("Computing on the GO," page 202). Deferred I/O lets you issue Print commands even when you're not connected to a printer or send out E-mail when you're not physically connected to a network. As soon as you've docked your portable machine to your desktop network, all these stored transactions are immediately processed in one big batch.

The Golden Age of Wireless

Deferred I/O is a nice concept, but the next evolutionary step is even better: wireless communication, which keeps your mobile device in constant contact with the network. Wireless communication comes in several varieties. One is the type that cellular phones use. This requires that the signals be routed through a network of centralized relay stations — the better to control billing for access to the network. That's just what the cellular-phone companies want and exactly what the computer companies interested in wireless networks are opposed to. Unfortunately, the airwaves are limited, and phone companies, computer companies, cable-TV companies, and all the other entities with an agenda for how to use the electromagnetic spectrum are competing for the same scarce resource.

The battle will be more political than technological, because the public spectrum is regulated by the Federal Communications Comission (in conjunction with various international agencies). If the cellular-phone companies win control over the airwaves — or, more specifically, over which regulatory model is in operation — we might end up with the ludicrous situation recently described to me by Larry Tesler, Vice President for Advanced Products at Apple Computer. In this scenario, the wireless link from your keyboard to your CPU first detours via the local cellular-phone company a few miles away before being sent

back to your office to finish what should have been a five-foot journey as the crow flies, and your phone company bills you a nickel every time you operate a remote keyboard.

If you want to prevent that kind of scenario, you should let the FCC know that you strongly support Apple's recent petition for spectrum allocation. You can send your comments to me c/o *MacUser* (or via Zmac), and I'll relay them on to Washington.

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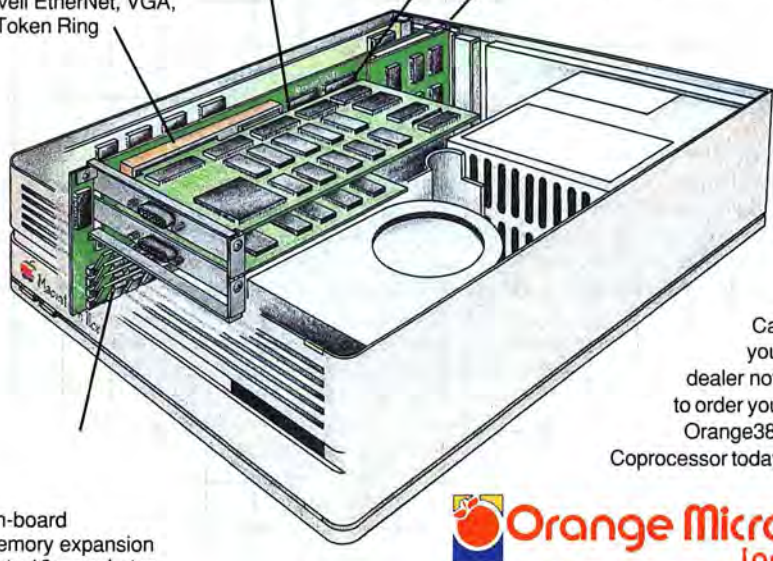
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CasualWare

Once your palmtop can seamlessly pop in and out of your network, you have achieved freedom of mobility, but you still need something more to get optimal productivity from your portable. If weight is the first bottleneck and network links are the second, the third is ergonomics.

You use machines that you carry with you at all times differently from those you sit down to work with. A ballpoint pen is not merely a miniature version of a quill pen—it's self-contained, it operates at the click of a button, it clips on to your pocket, it's clean, and so on. Watches are more than just small, light, mobile clocks; watches take into account other requirements such as water- and shock-resistance and intangible aspects such as fashion.

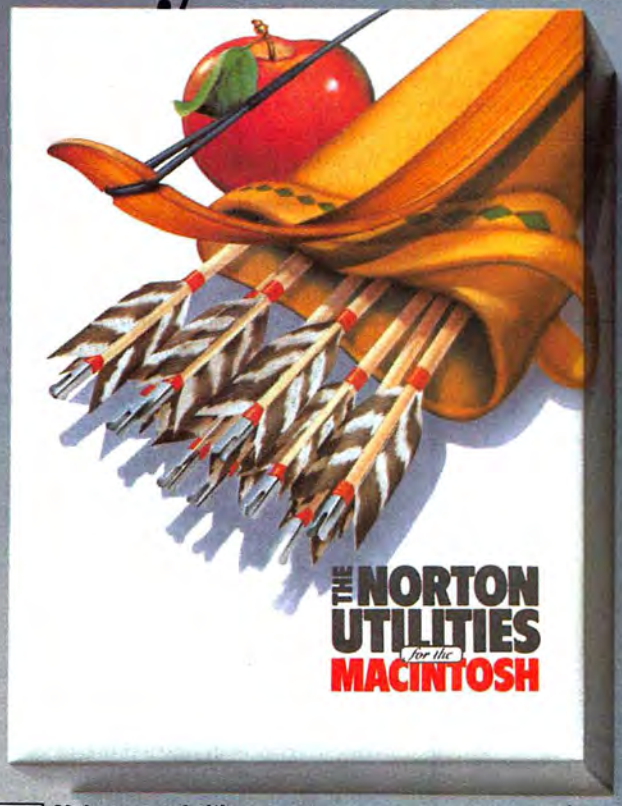
To be successful, a miniature, mobile technology must also be more than "high tech"; it must also be "casual tech." Remote controls are an example of a well-designed casual technology. Until you had one, you probably scorned them as absolute decadence. Now that you've got one, you'll never give it up; when the battery in your remote dies, it's panic time.

VCRs, on the other hand, are the opposite of casual. The clocks on the vast majority of VCRs are correct exactly once a day: at 12:00 A.M. — 12:00 A.M. — 12:00 A.M. — 12:00 A.M. . . . Most people don't know how to work their VCR; if you *must* access one of the dozens of features you bought the thing for but have no idea how to use, you know you're in for a frustrating half hour or so with a manual written in a dialect of English familiar only to Far Eastern manufacturers of consumer electronics.

Palmtop devices, in their current generation, are getting to be relatively intuitive, but they're hardly designed with human ergonomics in mind. Many keyboards don't use the QWERTY layout most of us know best. And even if they do, the keys are generally too small, the screens are hard to read in dim light, and so on. The underlying problem is that they're trying to mimic desktop computers, which is completely inappropriate for a portable device.

Besides, desktop computers are hardly a model worthy of mimicry: Computers have always tried to mimic typewriters, devices designed to slow down data entry to prevent overzealous typists from causing mechanical jams. Even with the addition of a mouse and menus, the Mac is still a far cry from a device optimally designed

Any resemblance to other Macintosh utilities is pure coincidence.



If that sounds like an outrageous statement, it sure is.

But then, this is one outrageous set of utilities.

In fact, comparing the Norton Utilities® for the Macintosh® to anybody else's utilities for the Macintosh is, well, kind of embarrassing.

Because when it comes to fixing your disk problems, rescuing your data and daily getting the utmost from your Mac,® nobody else even comes close.

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Which is one reason why—unlike other programs—we don't display hair-raising messages warning you of the "Risk of losing data" from using our utilities.

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Of course, any time a human being uses a computer—yes, even a Mac—there's a risk of losing data.

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Like the rest of the tools in this box, UnErase has been designed expressly for the Mac, to recover more kinds of trashed files, more quickly and with less effort on your part than any other program.



You can UnErase by File Type. By Text Search. Or use Quick UnErase to scan your fully loaded hard drive in as little as five seconds.

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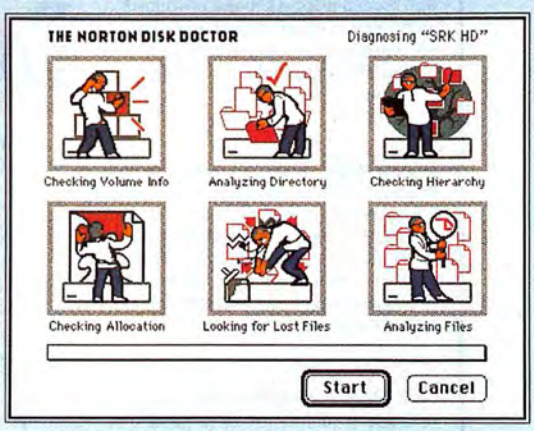
What a find.

Of course, you don't have to lose your data to want to get at it as quickly as possible.

That's something you want to do every day, every time you open a file.

So you'll be interested to know that *Fast Find* locates and opens files so quickly, you may never use the Mac's standard Find File accessory again.

If all of this looks too good to be true, see your favorite software dealer for a demonstration.



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for humans — unless those humans happen to have one hand with one centrally located finger and another hand with 105 fingers arranged in six rows.

The best-designed portable-computing devices today are the emerging crop of tablet computers. They have been designed from the ground up with one-handed clipboard-style operation specifically in mind. A big reason is that they rely on gestures instead of keystrokes, handwriting instead of typing.

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Babbage Patch Kids

How the machines fit into the fabric of everyday life makes all the difference in the world. For a peek at just how much of a difference these ergonomic factors can make, pick up William Gibson and Bruce Sterling's *The Difference Engine* (New York: Bantam/Spectra, 1991), a new sci-fi "reconstruction" of how the industrial revolution might have turned out if Charles Babbage's ill-fated designs for 19th-century computers had actually been realized. This cyberpunkesque vision of a world run by skyscraper-sized computers gives new meaning to the word *mainframe*. It's more than just a good read; it will make you all the more thankful for mobility and miniaturization and anxious for more.

But enough speculation. Just how is Apple putting all this into practice?

License to Kill

First, Apple needs to get a foot in the door — or, at least, a jack in the wall — anywhere and everywhere it can. The easiest place is in desktop machines of every flavor, and Apple is already doing this, having licensed AppleTalk to Tandem, GO Corp., AT&T, and Digital. It's also licensed Farallon Computing to develop AppleTalk products for DOS and Windows 3.0, has announced licensing agreements for its Data Access Language to third parties, and does not deny speculation that it is developing a version of the full Macintosh operating system for Intel-based PCs.

The Gideon Strategem

So eventually everything from palmtops to notebooks to workstations will be speaking AppleTalk. Great, but that doesn't get you very far until there's a portal to the global network around every corner, one into which you can dock your Mac Palmtop. Remember in *Star Wars* how C3PO just stuck his finger into a nearby wall socket to access the starship's computer? Until everything goes wireless, that's the kind of strategy Apple needs to pursue.

The first sites for these earthbound portals to the net should be aimed at the business traveler; that's who's buying and using notebooks today. If every Marriott, Hyatt, and Hilton hotel room had an AppleTalk jack in the wall, Mac notebooks would quickly become the machine of choice for frequent fliers. And if you got one frequent-flier mile for every minute of connect time you used, that wouldn't hurt

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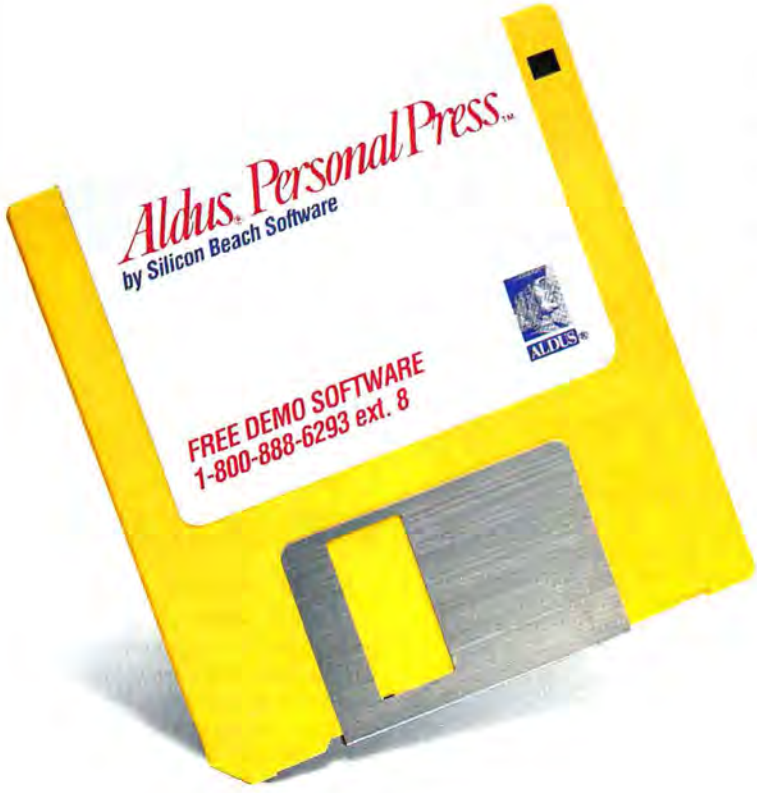


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System requirements: Macintosh Plus, SE, Portable, SE/30, and II series; System 6.0 or later required (6.0.5. is recommended); Two floppy disks (Hard disk is recommended); At least 1 MB RAM; Color monitor required for viewing color.

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either. (Why not start with Marriott, which recently severed its beverage contract with Coca-Cola in favor of John Sculley's alma mater, Pepsico?)

An AppleTalk port in every hotel room is a tall order, but there *is* a precedent for that kind of penetration; Apple just needs to hire the Gideons to evangelize it.

Swatch What Happens

This vision of Macintosh miniaturization and mobility may sound off the wall, but actually it's just off the cuff — literally. Check out the back cover of the March/April issue of *International Design* magazine, which features a high-concept ad from Apple's Industrial Design Group. The ad features a prototype of a bracelet that looks like a cross between an oversized Dick Tracy TV watch and a scaled-down version of Apple's Knowledge Navigator concept computer. This so-called TimeBand features a marble-sized trackball, modem and printer outputs, and a small speaker (or is that a microphone?) on the side. The top surface sports a $1\frac{3}{4}$-x-$2\frac{3}{4}$-inch high-resolution monochrome LCD display. The presumed function is to carry around, access, and modify data.

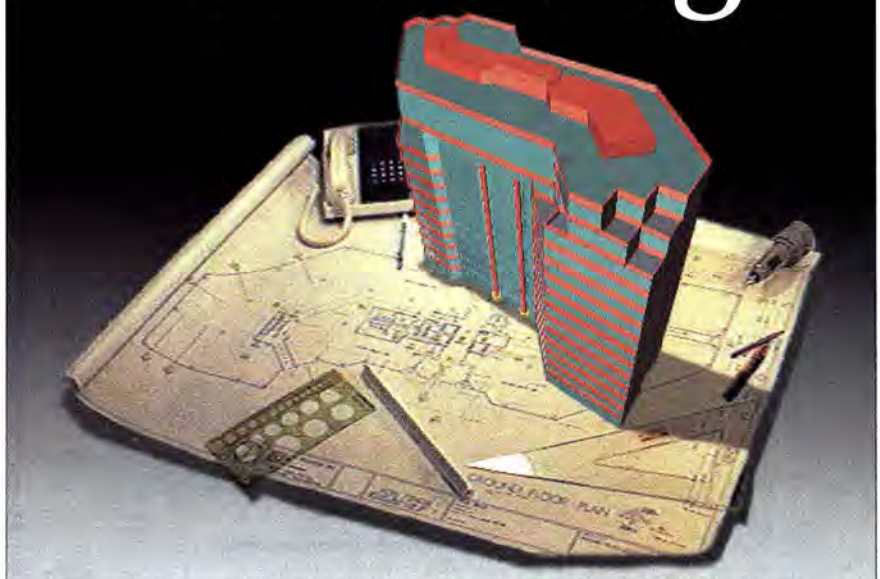
The TimeBand looks like science fiction, but there's no technological reason it can't be made today. Already, Mac entrepreneur Chuck Colby has shown working prototypes of a device with similar functionality and mobility. Called the Pocket Info Pac, it features a small memory-bank unit that can store up to 16 megabytes' worth of Mac screenfuls of information, which can be uploaded from any deskbound CPU over the built-in serial interface.

The most notable twist the PIP introduces is its display: an eyepiece with a tiny high-res LED display viewable only when placed up against your eye. This is somewhat less convenient, perhaps, than the TimeBand, but it has two advantages: (1) It's more private, and more importantly (2) it's real. Colby expects to have shipping units by the time you read this, with list prices starting at $899.

System 7, Windows 3

Mac users may still have many months of mobile- and miniaturized-hardware envy in store. But when it comes to software, Mac users are already squarely out on top, according to a just-released study Apple commissioned from an independent testing agency. If you need some ammunition to convince skeptics of the benefits of the Macintosh, call (800) 776-2333 and request a free copy of the Macintosh-versus-Windows report (#M1069LL/A). Bear in mind that the impressive margins racked up by the Mac were scored by machines running under System 6.x and that those scores will get even better when System 7.0 is released. And you can get a head start on that future by turning to our in-depth guided tour of System 7.0 right now.

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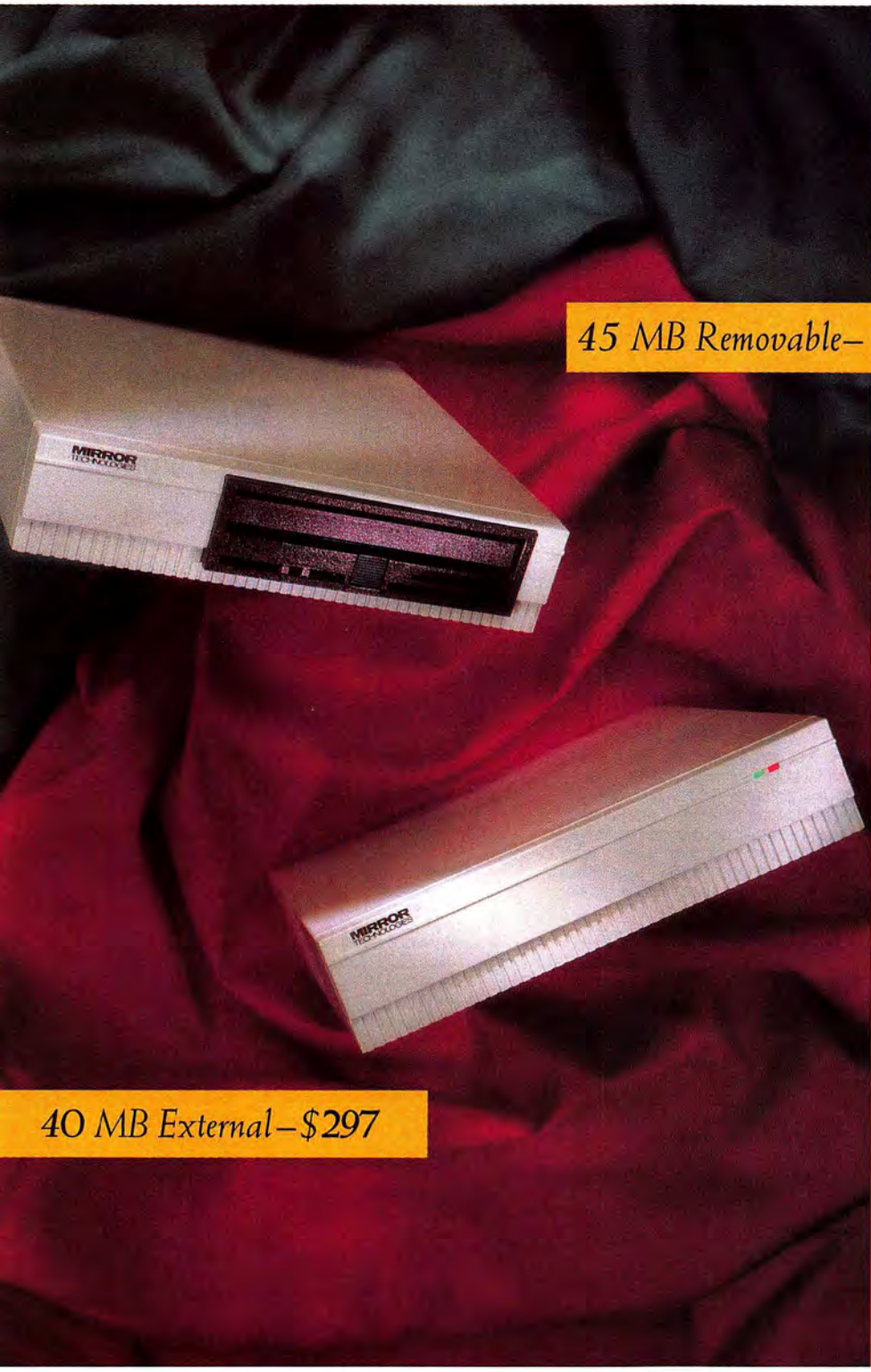
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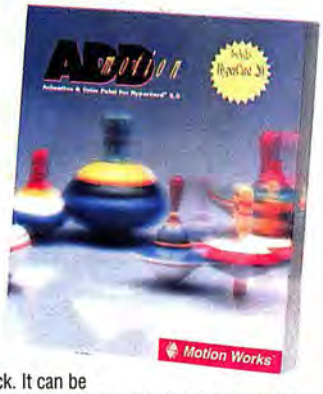
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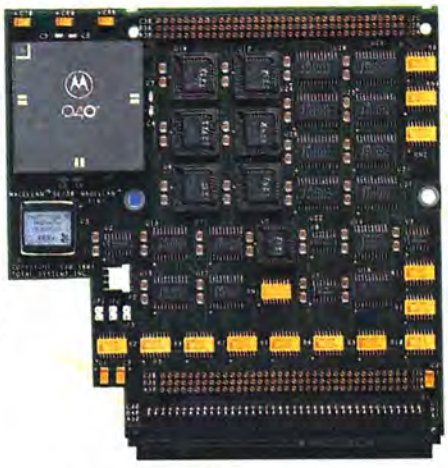
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Dynodex is the electronic address file that gracefully manages your most important information–names, numbers, addresses, and notes on people. Dynodex puts people at your fingertips – both on the computer and on the road. Instantly look up and dial any number you need from the full-powered Dynodex database or the handy desk accessory.

Dynodex or Dynopage$72



Beacon Technology HyperBible 2.0 or Gems of the Word

Experience an entirely new world of Bible study on your Mac! HyperBible is a HyperCard version of the famous Thompson Chain Reference Bible, complete with thousands of encyclopedia-type references. Gems of the Word is a bible program that everyone can enjoy! It gives you an easy to access database of over 2000 of the best loved, most often quoted passages. Gems offers a start-up program to give you a "Verse of the Day" personalized to your interests.

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Sitka/TOPS
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Systems Compatibility
Software Bridge Mac 78.



Technology Works, Inc. GraceLAN

GraceLAN lets you scan and profile every Macintosh, printer, PC, monitor, NuBus Card, network peripheral or SCSI device on any size network–without leaving your desk! Identify systems and memory configurations, software versions, desk accessories, INIT's, printer drivers and much more–all in real time. GraceLAN's powerful interface makes it easy to quickly obtain all kinds of detailed information. The Mac Details Window provides an extremely detailed report of each user's current hardware and software configurations in scrollable fields.

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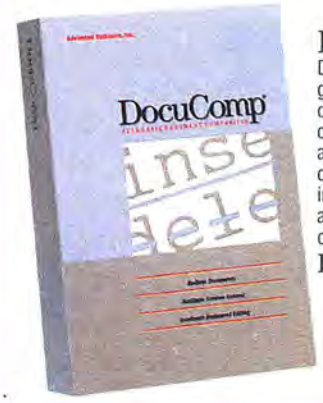
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Data Viz MacLink Plus/PC 5.0

MacLink Plus/PC 5.0 is a complete kit for transferring and translating documents between a Macintosh computer and an IBM PC. It comes with everything needed; an RS232 cable, software for both machines, the full library of translators, and DOS Mounter software. The library of over 350 conversion solutions translates file formats from word processors, spreadsheets, databases, and graphics, while the included DOS Mounter software provides visibility to DOS disks inserted in the FDHD drive both on the Macintosh desktop and within all Mac applications.

MacLink Plus/PC$135



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DocuComp ..$88

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DataLink LC Internal
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CompuServe
Navigator 3.0 48.
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Dove Computer Corp
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T/Maker
WriteNow 2.2 116.
Smart Bundle 214.
WordPerfect Corporation
WordPerfect 2.0 278.



Farallon Timbuktu 4.0

This new version of the Eddy Award winning software now supports color and provides clipboard exchange and full background file transfer. Timbuktu is a versatile network application that allows you to observe or control another Macintosh over any AppleTalk network. With Timbuktu, multiple users can share multiple screens across the network, thereby turning any software application into a team activity.

Timbuktu 4.0 $95

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How to Write a Business Plan$85

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Add photos, drawings, text, etc., into any application with Logitech's ScanMan Model 32 hand held scanner and enhanced version 2.1 software. Easily merge two or more scans into one full-page image. 32 gray scales offer superior image quality and easy editing capability. Save images in MacPaint, TIFF and PICT formats. Advanced halftoning capability provides optimum image output on your monitor or non-postscript printers.

ScanMan Scanner$298



I/O Design Inc., The Ultimate SE Carrying Case



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UnMouse$180

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The Oregon Trail$28



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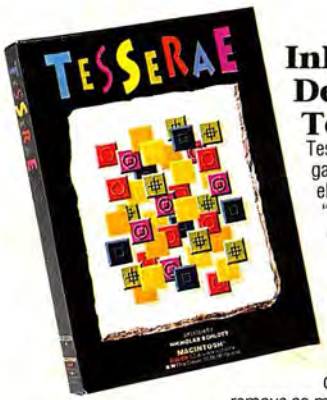


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ROBERT WIGGINS

Death of a Cult



Now that Macs are mainstream corporate tools, a new strategy is necessary to make sure workers get the computers they need — and they might not need Macs.

People who buy Macs have always been different from people who buy other computers. The very first Mac users were true pioneers, buying into Steve Jobs' vision at $2,500 a pop. These people are what marketing types call "early adopters." People like this are different almost by definition. And, to this day, the Mac continues to attract many early adopters, although they gravitate toward the top-of-the-line models, which cost almost four times as much as the original 128K machine. They are the same people who buy such things as laserdisc players, electronic organizers, and other high-tech gadgets.

After the Plus and the LaserWriter became available, the Mac market widened. Once it had enough memory and a SCSI port, the Mac no longer seemed so weak. When PageMaker came out, the Mac became a desktop-publishing machine, and although DTP doesn't get the kind of attention it once did, it remains a major force in the Mac market. DTP attracted even more artists to the Mac than had already been smitten, but, again, artists are known for being progressive and for trying new things and new technologies.

As time passed, the Mac became more of a mainstream purchase. Once relegated to the art department or to the desk of managers sufficiently powerful (or willing) to buck the trend toward a single office "standard" computer, Macintoshes began appearing on desks throughout corporate America. But even with wider acceptance, the Mac still faced an uphill battle on an important front: price. The Mac couldn't compete on price alone, not while PC clones were available for a fraction of its cost.

Classic Business Tool

In 1990 Apple took a giant leap toward leveling the playing field by introducing the Macintosh Classic, which is essentially a Mac clone. Some people scoff at the Classic because it's "only a Plus" at heart, chastising Apple for not lowering prices on the high-end machines. But these same people somehow overlook the fact that many low-cost PC clones are 80286-based machines, meaning that they're essentially "only ATs." The Mac Plus has competed with and outperformed the AT in tests that involved Mac applications facing off against equivalent DOS applications. Run the same tests today on a Mac Classic versus Windows applications on a 286 clone, and the Classic should win handily.

More Mac clones may appear too. In early 1991, a company called NuTek Computers announced a chip set and software that would enable manufacturers to develop true Macintosh clones. Should this technology actually work — and also survive the onslaught of Apple's hordes of legal eagles — non-Apple Mac clones may eventually hit the market, lowering prices further. And even if Apple does prevail in court, Mac prices will continue to face downward pressure from the PC clones because Windows has made them more competitive on a feature basis. For Mac buyers, it's a win-win situation.

This is good news for businesspeople. With the introduction of low-cost, high-capability Macs, price is not so significant in the buying equation. With the growing use of Windows on the PC and the concomitant rise in the use of Windows applications, such as Excel and Word, that have counterparts on the Mac and can exchange files, incompatibility has also been lessened as a potential problem. So at long last, the Mac and the PC have begun to converge, and the past decade's black-and-white demarcation has blurred into the gray area of managerial discretion.

Faith No More

Most important, the fundamental differences between Mac users and PC users have also been blurred. The decision between a Mac and a PC no longer has to be made on faith alone. The dogmas on both sides have softened, so people can focus on their job and spend less time fighting over the proper tool to use. We're entering the age of the platform agnostic, who chooses the computer that best fits the job and the user and who no longer tries to force everyone into a monolithic standard.

There aren't a lot of platform agnostics out there yet, but their numbers are growing. Because convictions die hard, it will be some time before the zealots on either side will concede that there are any advantages to the other platform. Some people will cling to their belief in the absolute superiority of their computer no matter what transpires in the real world. Just as there is a Flat Earth Society, so will there always be people who believe that DOS is the one true operating system and that Windows is an aberration that will wither and die. And there will be Mac enthusiasts who have spent so much time defending their choice of computer that they won't notice that the challenges have long since abated.

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Translucent

There are still some bumps in the road to true platform agnosticism. File sharing is easier but not transparent. Newer Macs with SuperDrives can read DOS-formatted disks, but special software such as Apple File Exchange or DOS Mounter is still required to let you get to the files. The Mac also has some proprietary archiving file formats, such as Compact Pro, that make telecommunicating with PCs more problematic because no PC programs exist to extract the files from these archives. Network-level file sharing between platforms is also being smoothed out, and the increasing numbers of cross-platform applications (such as PageMaker and PowerPoint) make file sharing simpler.

Speaking of networks, one of the only major drawbacks of the new inexpensive Macs is the lack of built-in Ethernet support. Such support would be nice in every Mac, but the rest can at least accommodate inexpensive internal Ethernet cards.

Ethernet capability is becoming a necessity in the corporate world, which has begun to strain against the limits of LocalTalk. External Ethernet boxes are available for the Classic, and, of course, you can link a group of LocalTalk-linked Classics to an Ethernet backbone. But a direct connection on the back of the machine would be the best option. The good news is that multiplatform networks are going to be the rule, not the exception, and that all vendors will be improving their cross-platform capabilities.

The time has finally come when managers can afford to be true platform agnostics. With the new lower-cost Macs and the potential of true clones in the future, cost justification is not the problem it once was. A Mac shop is no longer a hard sell to management. A mixed shop is not the nightmare it used to be, so PCs and Macs live together harmoniously in many offices. Applications that can share files across platforms and improved networks help minimize problems.

When you're making a purchase decision today, the most important factor should be the needs of the person who will be using the machine. Give people what they ask for, and they'll reward you with greater productivity. Force them to use an unfamiliar machine, and the loss in productivity will make any imagined cost savings moot. Remember, the people who are using the computers probably aren't platform agnostics yet, which is exactly why managers need to be.

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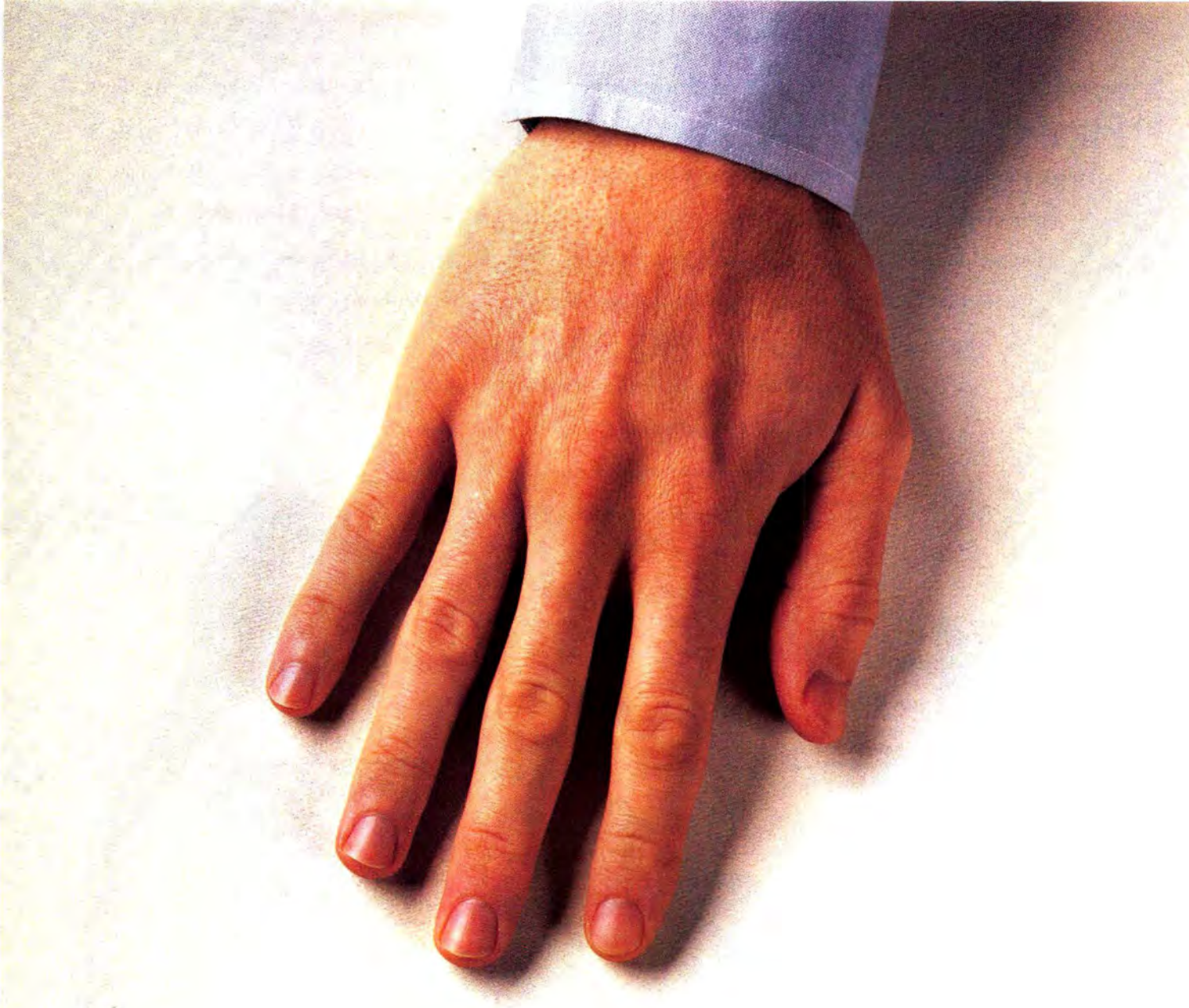
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A Kinder, Gentler Apple



Apple's first priority is to sell Macs, but the folks in Cupertino still do some cool stuff that actually contributes to the good of mankind.

Many Apple employees are zealously doing cool things you've probably never heard of. They don't get the press that research and development or marketing people do, but they are important to the Macintosh experience nonetheless.

Electronic Curb Cuts

Alan Brightman once had Apple executives put their hands into their pockets and a pencil into their mouth and then try to use a Mac. Today Macs are much more accessible to handicapped people as a result of such meetings and because of the work done by Alan and his Worldwide Disability Solutions Group.

The goal of this group is to enable disabled people who don't want to feel "special" to feel "ordinary." The group creates electronic curb cuts for disabled people. For example, imagine that you are using a Mac with a head stick or mouth stick. Sticky Keys lets users type keys one at a time and achieve the effect of simultaneously pressing more than one key. Mouse Keys lets users simulate every action of a mouse by pressing keys on a numeric keypad.

To get more information about Apple's Worldwide Disability Solutions program and about products for disabled people, call (800) 732-3131, ext. 950. To volunteer your help, contact a related organization called Alliance for Technology Access at (415) 528-0747.

Little Green Apple

When Apple's employees returned from the holidays on January 2, 1990, they were greeted by a message from John Sculley that crystalized Apple's commitment to recycling with the slogan "Changing the world by taking care of it."

Apple's environmentalists had begun white-paper recycling the previous year. Many started recycling programs in their own building. As is often the case at Apple, their efforts snowballed, and in May 1989, Apple's executive staff approved the Apple Recycles program.

Apple Recycles now has a full-time staff of ten. Their mission is the greening of Apple. At the product level, the cross-departmental Environmental Packaging Team works on package design, product materials, and documentation. At the employee level, the group helps educate people about recycling paper, glass, and scrap.

David Skinner manages Apple Recycles. He is making Apple a leader in environmentalism among American corporations. To get more information about Apple Recycles, contact David at (408) 974-6017, Skinner.D (AppleLink), or (408) 974-1950 (fax).

Apple, Can You Spare a Dime?

I was surprised to learn about an Apple program run by Tim McNally called the Strategic Loan Fund. It provides loans to developers to help them bridge the last few months of product development and introduction.

The fund began as an adjunct to Apple's venture-capital fund. The Strategic Loan Fund provides loans of as much as $500,000 for as long as two years, with a balloon payment or quarterly interest payments leading to full repayment in the last six months of the loan. The interest rate is prime plus 1.5 to 2 percent. Apple also takes stock warrants to purchase a small equity interest in developers.

Before you ask for a loan, you should understand how the fund works. First, most of the leads are generated by Apple employees — such as evangelists and marketing people — who have been working with the developer. If a developer contacts fund personnel directly, the inquiry is referred to an Apple employee who has expertise in the product category.

Second, the requirements are rigorous. So don't think that Apple is easy picking. A developer's product, cash-flow projection, secured assets, management, and market opportunity are scrutinized. The fund has been making loans to only 10 percent of the 100-odd applicants it has each year.

If you're interested in applying for a loan, ask your Apple evangelist or marketing contact to sponsor you. Call (408) 974-6226 for more information.

Apple's Community Chest

When I was an Apple employee, one of the questions people most commonly asked me was how they could get Apple to donate equipment to their nonprofit organization or cause. Well, now Apple has a department called Community Affairs, run by Fred Silverman. Fred and his colleagues "give the tools of change to the agents of change." (You've got to love these Apple slogans.) In 1990 Fred had about $8 million of equipment (priced at suggested retail) to distribute.

Community Affairs programs are divided between two primary constituencies: schools and nonprofit organizations. The school program operates on an annual schedule. Guidelines are published in the fall, and grants are

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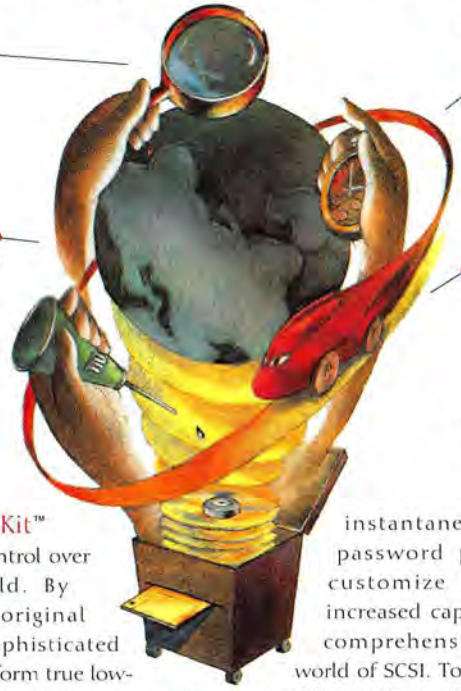
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awarded in the spring. The program focuses on "at risk" students who need extra help.

The nonprofit program is for organizations that have already fulfilled the Internal Revenue Service requirements for 501(c)(3) status. Community Affairs is looking for substantive, unique applications of Apple's products. This is a nice way of saying that Community Affairs is not going to give folks Macintoshes to do word processing or to desktop-publish a newsletter.

If you'd like more information about Community Affairs, call Fred at (408) 974-2974.

Fred also runs a program that matches the needs of communities with Apple employees who want to volunteer their time. If your organization can use the help of Apple employees, call Anne McMullin at (408) 974-2116. Remember that most Apple volunteers live in the San Francisco Bay Area.

Just Add Water

Of the five programs I'm highlighting in this column, Apple's work with user groups is probably the best known. There are about 1,190 such groups, geared to specific constituencies including government, higher education, K – 12, corporations, and the general community. They help Apple improve the Macintosh computing experience for its customers.

Craig Elliott and his staff of seven manage Apple's user-group and -association efforts. They produce videos, publish newsletters, assemble new-product kits, maintain a user-group advisory council, and periodically operate a training course for user-group leaders. They also publish a guidebook about forming user groups, called *Just Add Water*.

If you register your user group with Apple, you will receive these fruits of Craig and his employees' work. You can also obtain an AppleLink account at a discounted rate, purchase a limited quantity of hardware at a discount for user-group activities, license Apple's system software for redistribution, and attend Apple's Macworld Expo user-group meetings and other events. If you're interested in joining, forming, or registering a user group, call (800) 538-9696, ext. 500, for information.

When you peel away Apple's skin and encounter programs such as these, you've got to like what you see. Now, take advantage of the fruits of Apple's labors, and get involved.

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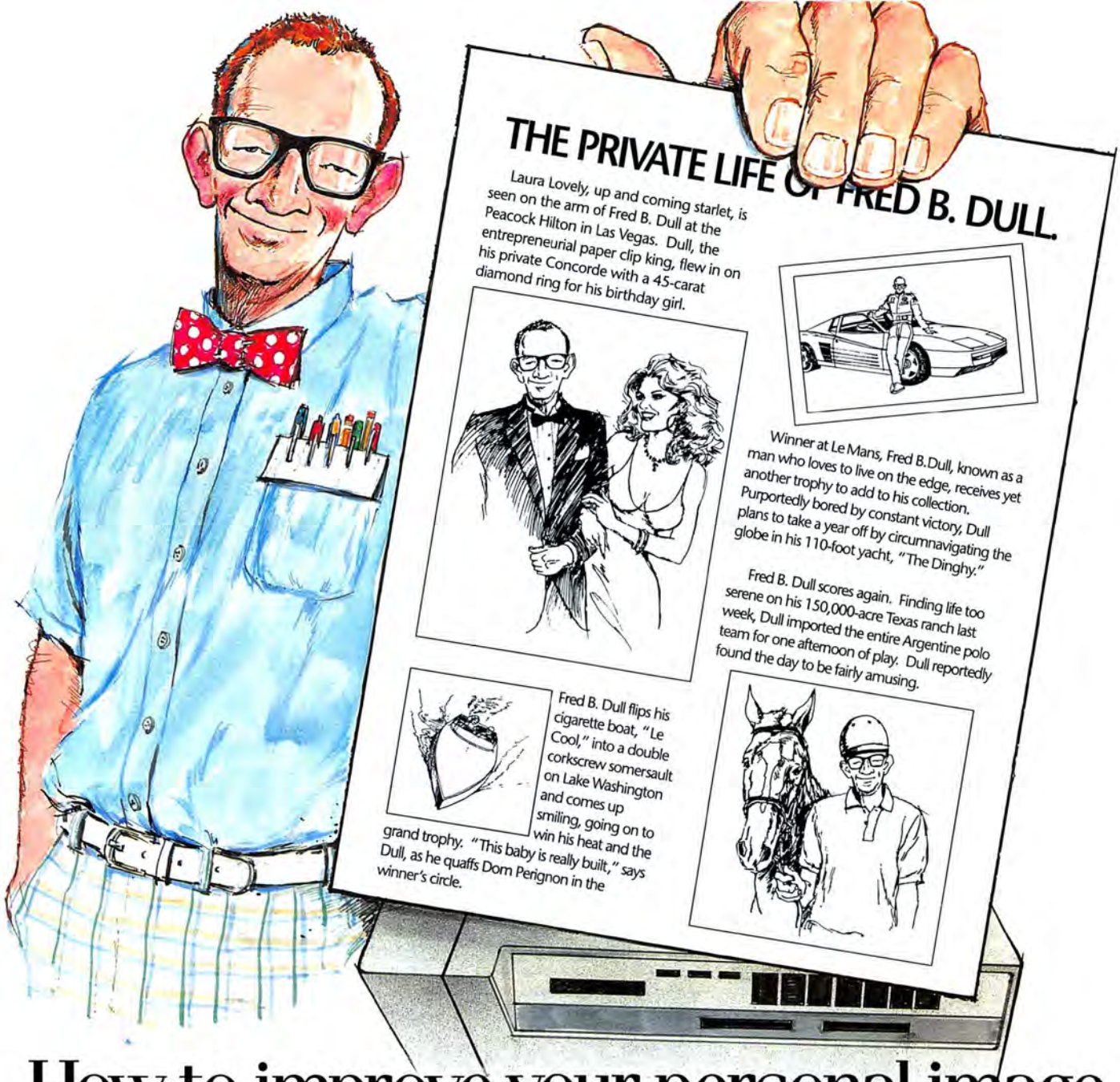
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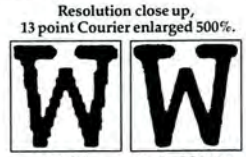
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MICHAEL SWAINE

Next Year in Xanadu



Sure, System 7.0's hot, but what if you could preview the wonders of System 9.0 or 10.0? Look no further than your local SilverStand.

System 7.0 is nice enough, I guess, but it's so *incremental*. There are revolutionary products out there — full striding steps forward — each waiting for the break to make its breakthrough. Imagine

"I can imagine a time . . . when 'books' . . . will have changed to their proper electronic environment. In that exciting future world of publishing . . . perhaps large bookstores will become 'Infomarts.' As Prince Albert's Glitzy Crystal Palace ushered in the Industrial Revolution, so glitzy 'Infomarts' are ushering in the Information Revolution," hallucinates R. Patton Howell in his forthcoming *Beyond Literacy: The Second Gutenberg Revolution* (Prima Publishing).

If Howell can imagine that, it's probably because he's read Ted Nelson's description of SilverStands, the neighborhood drop-in centers where you buy information like you buy hamburgers — those local outposts of the Xanadu hypertext network that look like "a marriage between Star Trek and McDonald's . . . staffed by an attentive crew in perky uniforms The motif is silver, but with other colors changing seasonally; there are a changing variety of tasteful accessories."

The structure itself will have a "castle-like exterior . . . faced with semisilvered twin glass, allowing external view without bringing in too much light . . . A geodesic dome, starting as a very small arc over the center, grows and is rearranged as the whole configuration expands" (Theodor Holm Nelson, *Literary Machines 90.1*, [Sausalito, California: Mindful Press, 1990]).

Although Nelson has trademarked the term *SilverStand*, these stands don't exist any more than Howell's Infomarts do. But the software that will make SilverStands possible is nearing completion. It's called Xanadu/Server, and it's being developed by the Xanadu Operating Company (XOC), a subsidiary of AutoDesk. It could be available on Sun workstations late this year and on Macs as early as next year.

Xanadu/Server implements a radical new model for storing and accessing information, quite different from, say, System 7.0. Designed specifically for electronic publishing and *hypertext* (another term Nelson originated), this software could have enormous implications for publishing and other forms of information handling. Ted Nelson began working on his Xanadu (also trademarked) project 30 years ago as a graduate student. Eventually realizing that he couldn't do it alone, he began to seek programmers and funding. The programmers were easier to find than the funding, and the project dragged on for years. Finally in 1988, AutoDesk bought XOC and began to make it happen, in the form of Xanadu/Server.

All by itself Xanadu/Server represents a break with the prevailing prejudices about information storage and retrieval, but that's not the whole of Xanadu. The complete realization of Nelson's Xanadu project will require linking Xanadu/Server nodes into a large hypertext network, the implementation of the publishing system, and the franchising of SilverStands. All this may begin to happen on the heels of the AutoDesk release; Nelson says he hopes to open the first SilverStand in Palo Alto, California, early in 1993.

The Crystal Trip

To get an idea of how SilverStands may change the way we access information, consider a concrete example of that elemental act of literary economics: buying a book.

You walk into a bookstore and see a book on Dwight D. Eisenhower: James Bacque's *Other Losses*, which the point-of-sale display describes as a runaway best-seller in Germany, a "controversial" book in Britain and Canada, and newly released in the U.S. But what's this? A glance at the opening pages reveals Bacque's premise: Eisenhower knowingly allowed hundreds of thousands of German POWs to starve to death toward the end of World War II. If this is true, it's monstrous, and your opinion of Ike is in need of serious adjustment. The charge seems incredible. Could it be true?

Let's see what the *New York Times* reviewer thought of the book:

"Mr. Bacque misuses documents; he ignores contrary evidence; his statistical methodology is hopelessly compromised; . . . he puts words into the mouth of his principal source; he ignores a readily available and absolutely critical source that decisively deals with his central accusation; and, as a consequence of these and other shortcomings, he reaches conclusions and makes charges that are demonstrably absurd" (Stephen E. Ambrose, *The New York Times Book Review*, February 24, 1991, page 1).

You won't find the *Times* review affixed to the dust jacket of *Other Losses* in the bookstore to inform your buying decision. But in a SilverStand you would, which is the whole point of this story. Let's take a stroll through Nelson's crystal palace.

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Browsing electronically through the electronic equivalent of jacket copy for *Other Losses*, you quickly see that you're going to want a second opinion on any diagnosis as serious as this author's, and you ask to see the review links for this document.

How you do this — perhaps via a pop-up menu — is up to the third-party developer of the application you're using as a front end to Xanadu/Server. Xanadu itself is back-end software, like an operating system. Your ability to see links, however, does not depend on the front-end software or on the willingness of *Other Losses*' publisher for you to see the reviews; this capability is built in to the Xanadu software. It is part of what it means to publish a document in the Xanadu system. This link-following is not the same as the ability to follow links in a product such as HyperCard. In HyperCard you can click on buttons and follow their links to other cards or stacks, but you can't tell what other cards or stacks might have links to the current card. HyperCard links are unidirectional. Xanadu lets you examine all links that lead from *or to* the current document, even if they were created on other machines in other locations and at a time subsequent to the creation of the current document.

Xanadu supports an unlimited variety of link types, but all you're interested in just now are reviews. You note that there are quite a number of foreign reviews plus the self-published opinions of several individuals, but you keep looking until you find the *New York Times*. You request and read the *Times* review at your SilverStand cubicle. A small royalty — certainly less than the cost of that issue of the *Times* — is charged to your account. And you make up your mind about *Other Losses*.

The core of any SilverStand will be its Xanadu/Server software. AutoDesk's Xanadu/Server is an operating environment conceptually far in advance of anything yet seen from Apple, Microsoft, or IBM. At the heart of the Xanadu/Server model is the concept of a document. The following observations about Xanadu documents should convince you that they represent something new.

A Xanadu document has both an identity and a state. Its identity is represented by our perception of the document as a discrete, persisting entity. Its state is represented by the ordering of the underlying bits at a particular time. Of course, every document stored in digital form has an identity and a state, according to these definitions. The difference in the Xanadu system is that this abstract distinction between the document's enduring identity and its transient state is reflected in software. Both the identity and the state of a document are represented by system-generated objects — a powerful feature.

A Xanadu document is not WYSIWYG. WYSIWYG (what you see is what you get) has been held up as a desirable goal in software, but Ted Nelson sees it as a liability. Although you can print out a Xanadu document and take home hard copy, the document itself is more than the printout. Xanadu documents exist not in isolation but in a rich context that is always available from the document. What you see depends on how you look. There is no single thing you *get*. The document just *is*.

A Xanadu document is not a file. Xanadu documents can include parts of other documents — not as copies, but literally — and a given document may be a literal component of several other documents, in a model somewhat like publish-and-subscribe in System 7.0. And when Xanadu/Server nodes are linked, the system is supposed to make all the connections transparently across machines: It doesn't matter where the data is.

Xanadu documents also have a temporal existence. You can examine past editions of a Xanadu document, studying its development. There can also be variants, alternative forms of a document such as what-if scenarios in a budget. The system keeps track of the relationships among these variants and editions, all of which share a single identity.

Finally, there is nothing in the Xanadu-document model that restricts documents to text. In fact, the intention is that Xanadu/Server should be a multimedia engine and that it should apply the data integrity, performance, and security of traditional high-end database-management systems to the not-so-traditional area of managing unstructured multimedia documents.

Until AutoDesk actually releases Xanadu/Server, we won't know whether this radical approach to data modeling is practical. And then we still won't know whether people will actually flock to SilverStands. What is clear is that AutoDesk is willing to push the technology a little harder than Apple or Microsoft is, and that's good for all of us.

For more detail on the history and general plan of Xanadu, see *Literary Machines 90.1*.



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NEW ON THE MENU

Ever wonder why you can buy a formatted gigabyte hard drive but have to manually format every floppy disk you get out of the box? Well, 3M figures that users will be willing to pay 10 percent more for the convenience of a pop-and-play solution, so the company is now shipping formatted floppy disks. It's about time someone did it.

By Russell Ito

Printing money: Who'd have thought that Apple, of all companies, would be in the forefront of a price war? Strange as it seems, that's exactly what's happening in the printer market. Cupertino's new budget printers (which we profiled last month) have made a significant impact throughout the industry. ✘



Abaton's LaserScript LX is the first PostScript-compatible printer to break the psychological $2,000 barrier, coming in at $1,995. The Abaton ([800] 444-5321) is a 6-ppm, 300-dpi unit with automatic emulation switching, and it's the first printer to use the Microsoft Bauer PostScript clone. Who'll want a PostScript clone once PostScript Level 2 printers have started shipping? You might — once you've found out how much Adobe will want for its latest rev. ✘ Meanwhile GCC Technologies ([800] 422-7777), which pioneered low-priced laser printers, has answered Apple's challenge by cutting its prices on three models. The result is the first laser printer for less than $1,000: the Personal LaserPrinter II (PLP II), at $999. GCC also cut the price on its PLP IIS to $1,499 and reduced its PostScript Business LaserPrinter II (BLP II) to $1,999. Unfortunately for GCC, Abaton beat it to the "PostScript for less than $2,000" announcement by a few weeks. ✘ And not be to outdone (or underdone, as the case may be), Hewlett-Packard ([800] 752-0900) cut $400 from the price of its LaserJet IIP, now $2,195. Shortly after that, HP introduced the PaintWriter, a 180-dpi color paintjet, for $1,395. Sometime this fall, you can expect a Mac version of HP's 300-dpi, 17-ppm, RISC-based LaserJet IIISi, which will have PostScript on the motherboard — not on a cartridge. It should list for around $6,500. And in the face of the StyleWriter challenge, don't be surprised if HP drops the price of the DeskWriter too. ✘ But the cheaper-printer trend hasn't hit everyone: Apple still lists the ImageWriter II for $595. Old habits die hard.





Up to Date . . .

Symantec Anti-Virus for Macintosh (SAM) version 3.0 now supports file repair and downloadable virus definitions from Symantec's BBS. (408) 253-9600. $99.95. ✘ LetraStudio, Letraset's type-manipulation package, is now in version 2.0, and it supports all Type 1 and Type 3 fonts, Illustrator artwork, and Pantone colors. (201) 845-6100. $495. ✘ FontStudio, Letraset's font-creation package, has been upgraded to version 2.0 and can now create hinted PostScript Type 1 and TrueType fonts. (201) 845-6100. $595.



The new Apple Portable isn't any smaller and doesn't weigh any less, but it is backlit — and more than $1,000 cheaper.

Sneaking the New Mac Portables

Apple's product rollouts are generally high-key affairs with lots of hoopla, but the announcement for the revised Mac Portable was so low-key that it was practically invisible.

Invisible, of course, is how some users described the original Portable's display. Apple's active-matrix LCD panel looked fine under normal lighting conditions, but the display disappeared if the light hit the screen in the wrong way or if the room was dark. To fix this problem, Apple has added backlighting, which makes the screen more visible but which also cuts the battery life roughly in half (from eight to ten hours, to three to six hours). However, the backlighting can be turned off.

Apple has also changed the RAM configurations. The original Portable came with 1 megabyte of static RAM standard on the motherboard. Because 1 megabyte was basically useless, Apple has now increased the standard configurations to 2 or 4 megabytes, but Apple has also changed the type of RAM. Instead of static RAM, the new Portable uses "low power," or pseudo-static, RAM that's cheaper than static RAM but steals a tiny amount of power from the batteries.

The new Portable, which replaces the original model, still weighs 15 pounds, and the only thing about it that's smaller is the price: Apple has cut it by more than $1,000.

And for those of you who caught the plural in the headline, Dynamac, the first Mac-portable packager, has three new models we'll be detailing next month. But just to whet your appetite, they're all based on the LC, with options that include a leather portfolio model, 16-megahertz 68030/68882 configurations, and hard drives with up to 100 megabytes.

Apple Computer, Inc., 20525 Mariani Avenue, Cupertino, CA 95014; (408) 996-1010. 2 megabytes of RAM/40-megabyte hard disk, $4,199; 4 megabytes of RAM/40-megabyte hard drive, $4,699.

Kids' Paint

It's hard to believe, but kids who were born the same year as the 128K are now in first grade. Although the Mac's first generation of users has graduated from MacPaint to Photoshop (OK, maybe not), their younger siblings now have their own graphics package: Kid Pix.

Kid Pix is a color paint program designed specifically for children, but it's more than just a paint program. Every tool in Kid Pix has its own unique sound, so the paintbrushes slop, the pencil scratches, and the mover tool sounds like a moving truck. And by using a MacRecorder, or a IIsi or LC, nascent artists can add their own sounds.

All the tools are designed with kids in mind. An eraser called the Firecracker blows up an image. There are more than 100 "rubber stamps," including skateboarders, UFOs, and dinosaurs, and there's an eraser that erases the current artwork to reveal a completely different, random picture — anything from a ladybug to a bird. Kid Pix is even bilingual: If you type a letter or number, the program can say the character in English or Spanish.

Kid Pix is the first paint program that makes the process of creation as important as the finished image. Now if the kids could just get it away from their parents long enough

Brøderbund Software, Inc., 17 Paul Drive, San Rafael, CA 94903; (415) 492-3200. $49.95.



Kid Pix is a paint program specifically for kids. The tools have unique sounds, and there are trick tools too.

SyQuest Doubles Up

With erasable optical storage still out of the price range of most users, SyQuest removable cartridges and drives have become the standard in removable media. Some users' data requirements, unfortunately, have outstripped the roughly 43-megabyte capacity of those cartridges/drives, so now SyQuest has begun shipping a unit with about twice the capacity.

SyQuest's SQ5110 is an 88-megabyte drive whose cartridges should have a formatted capacity of about 85 megabytes. The high-density cartridges are the same size as the formatted 40-megabyte ones, and the new drive can read from — but not write to — the older cartridges. The average access time is 20 milliseconds.

Because SyQuest is strictly an OEM, you'll have to choose among three manufacturers to buy one of the new drives.



SyQuest's latest removable-cartridge drive packs double the capacity of the previous model: 85 megabytes.

Mass Microsystems, MicroNet Technology, and Peripheral Land will be the first companies to offer the new drives.

Mass Microsystems, 810 W. Maude Avenue, Sunnyvale, CA 94086; (408) 522-1200. DataPak 88, $1,799; DataPak 88IIc (twin unit for IIci footprint — other footprints available), $1,899.

Micronet Technology, 20 Mason, Irvine, CA 92718; (714) 837-6033. MR-90, $1,795; MR-90R (includes Retrospect Remote), $1,995; SB-9090 (twin unit, includes two cartridges), $3,590.

Peripheral Land, 47421 Bayside Parkway, Fremont, CA 94538; (415) 657-2211. Infinity 88 Turbo, $1,799; Infinity 88/CD-ROM (includes CD-ROM drive), $2,995; Infinity 88 Twin (twin unit), $3,695.

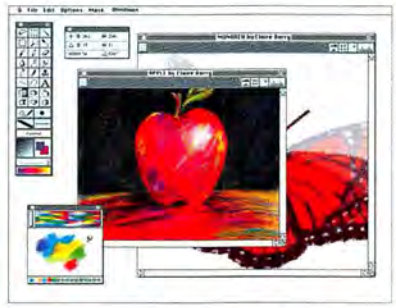
Medialess Images

Just as you're getting over the concept of an *analog* floppy disk full of video images, Dycam has introduced a point-and-shoot, true digital camera with no removable media at all.

The Dycam Model 1 is a portable, digital, still camera that can capture 32 images with up to 256 shades of gray, at a resolution of 376 x 240 pixels. The camera weighs less than 10 ounces and holds all the images in RAM. Once you've filled the RAM capacity, you download the images to your trusty portable (either IBM-compatible or Mac) by way of the Model 1's adapter, which connects to the computer via a serial port. If you plug the adapter into an AC socket, you can also recharge the camera while you make the transfer.

Although the Model 1 doesn't capture color images, the captures are suitable for newspaper and magazine halftones.

Dycam, Inc., 9588 Topanga Canyon Blvd., Chatsworth, CA 91311; (818) 998-8008. $995.



PixelPaint Pro 2.0 comes with a new interface and pressure-sensitive tools.

At Last, PixelPaint Pro

It took a while for the paint to dry, but SuperMac Software has finally shipped PixelPaint Professional 2.0, which boasts a host of new features and a completely redesigned interface with a larger and more accessible Tool palette.

A total rewrite of version 1.0, PixelPaint Pro now includes not only pressure-sensitive tools that can simulate traditional art media, such as charcoal, pastels, and watercolors (much as in Time Arts' Oasis), but it even includes a surface simulator, so artwork can look as if you drew or painted it on linen, slate, or concrete.

Some other improvements include a wet-paint option that lets you manipulate any brush stroke to suit. MeshWarp is an image-manipulation tool for changing the area within and around an image fragment, letting you do such things as curl up a droopy mustache.

Image processing, including color correction and special effects, is a major addition to PixelPaint. And for prepress output, the program can now handle spot- and four-color separations.

SuperMac Software, 485 Potrero Avenue, Sunnyvale, CA 94086; (408) 225-2205. $799.



The Dycam Model 1 is a medialess digital camera that takes point-and-shoot gray-scale "pictures."

NewsLine

Reports and Analysis

Apple Slashes CPU Prices
CUPERTINO, CA — Almost immediately after cutting the prices for its laser printers (detailed last month in "Personal Best: Two New Apple Printers," page 90), Apple Computer slashed its prices for its midrange and high-end computers. The base model Mac SE/30 (1 megabyte/40-megabyte hard drive) is being cut $1,000, to a list price of $3,369, and the 4-megabyte/80-megabyte hard-drive model is being cut $1,700, to $3,869. The Mac IIci is being cut $700 in both its floppy-drive and 80-megabyte hard-drive configurations; both configurations also come with 5 megabytes instead of 4 megabytes of RAM. The new prices are $5,269 and $5,969, respectively. The Mac IIfx's price cuts range from $1,600 to $2,300, depending on the configuration. At the same time, Apple also announced that the Mac IIsi would now come standard with 3 megabytes of RAM instead of 2.

SuperMac Spins Off Software
SUNNYVALE, CA — SuperMac Technology continued its evolution into a color-graphics-hardware company by spinning off its remaining software products into a new company, SuperMac Software. Although the parent firm will remain a minority stockholder in the new venture, SuperMac Software will operate independently and will be financed primarily through institutional and venture capital. The firm's initial software line will include two PixelPaint and two DiskFit products and Sentinel.

Sierra Buys Brøderbund
SAN RAFAEL, CA — In a merger of computer-entertainment powers, Sierra On-Line has announced that it will buy Brøderbund Software for approximately $37.9 million worth of stock. The new company, to be named Sierra-Brøderbund, will maintain the original companies' separate product lines, but the two firms will share a distribution system. The deal, still not final at press time, was subject to approval by the stockholders of both companies.

WordStar Acquires Lifetree
NOVATO, CA — WordStar International has acquired Lifetree Software, the developer of Correct Grammar. Lifetree will be the heart of WordStar's new Writing Tools division, whose charter is to develop and market a line of word-processing enhancements, including grammar and style checkers.

WORD PROCESSING

WordPerfect

WordPerfect for the Macintosh is back with a new look and formatting power that is unequaled by any other Mac word processor.

WordPerfect has achieved a stunning turnaround with the new Mac version of its top-selling DOS word processor. Unlike the original WordPerfect for the Mac, version 2.0 looks and feels like Mac software should. What's more, WordPerfect 2.0's formatting controls and style-management system can't be matched by any other Mac word processor. To tap WordPerfect 2.0's power fully, however, come prepared to wrestle with a formidable code-based formatting system that's far from easy to use. Fortunately, you can hide the codes if you don't need them.

The Second Time Around

We won't dwell on the shortcomings of the first version of WordPerfect for the Mac. Suffice it to say that those users who remember its impossible interface, lack of style sheets, and total reliance on arcane formatting codes are in for a pleasant surprise.

WordPerfect's interface has been totally reconstructed in version 2.0. Gone are the original version's clumsy hierarchical menus. In their place are dialog boxes that pack a lot of wallop into a small space, thanks to the clever use of pop-up menus. Most dialog boxes are nonmodal too, so you can edit your document while they're on-screen. Another welcome addition is the ruler, which lets you define tabs, margins, justification, column configuration, and other formatting attributes.

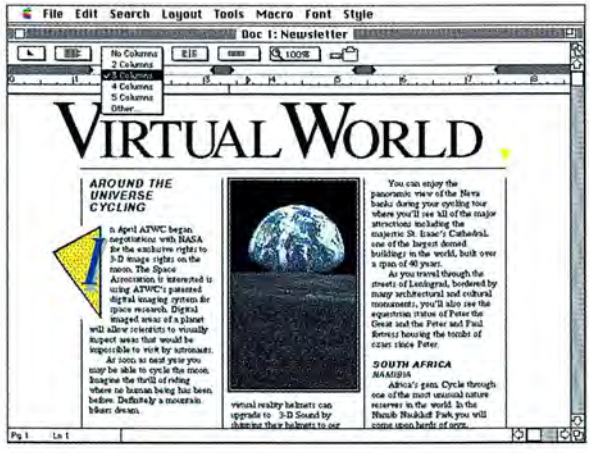
The Code window is an option in the new version; you don't have to learn the program's infamous formatting codes unless you're fine-tuning document-formatting controls.

Formatting with Style

You can automate formatting tasks with WordPerfect's new style sheets. When you define a style, the program actually creates a set of formatting codes that will be inserted into the beginning of the paragraph to which you're applying the style. You can save almost any formatting-code selection to a style sheet. When you edit styles, WordPerfect automatically changes the relevant codes wherever they appear in a document. To utilize the program's flexibility for document formatting, however, you must master WordPerfect's complex code-based approach. For example, you create custom-formatted run-in heads as part of a style by entering text and code at the beginning of a paragraph.

Once you've created several style sheets, WordPerfect helps you manage them with the best style-management system of any Mac program. You can, for example, store paragraph styles in individual documents, in a Private Library on your own machine, or in a Common Library on a network server. When you're editing a document, you can apply a style regardless of where it's stored. If you change a style in your Private Library, the change is reflected throughout all the WordPerfect documents on your machine in which that style is applied. Even more impressive, changes made to a style in the Common Library will show up in every WordPerfect document on the network that uses that style.

WordPerfect 2.0's page-layout features rival those of long-document-publishing heavyweights Ventura Publisher and FrameMaker. You can anchor text and graphics frames to a particular page or to a paragraph. You can even anchor frames so they flow as if they were characters. And WordPerfect lets you automatically number captions for graphics frames, providing an excellent way to create cross-references and lists of figures and tables as you go.



WordPerfect 2.0 sports a well-designed new interface that provides easy access to most of the word processor's powerful tools. Pop-up menus on the ruler let you easily set columns of equal and unequal widths. For long documents, WordPerfect's page-layout tools rival those of some page-layout programs.



A powerful search-and-replace function lets you enter formatted text in WordPerfect's Find dialog box. But beware: You still have to cope with the program's complex formatting codes to get the most out of WordPerfect 2.0.

To enhance the appearance of your documents, WordPerfect lets you select text and background colors and choose from a wide variety of border options. You can set borders around frames, paragraphs, pages, and even selected ranges of text.

WordPerfect 2.0 features extraordinary flexibility and control over columns. Column commands are easily accessible through dialog boxes or the ruler, and you can specify columns of equal or unequal widths (try *that* in Microsoft Word 4.0) in newspaper, parallel, or extended formats. You can even save columns to style sheets, something else you can't do with Word. Although WordPerfect has no table editor, its parallel columns let you create tables much as you do with Word. WordPerfect's border and fill options, however, put Word tables to shame.

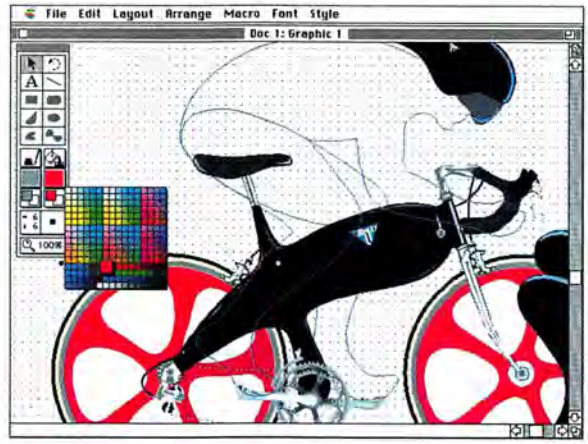
WordPerfect's capable built-in drawing program lets you create and edit graphics without leaving the word processor. You can place graphics within a frame or use overlays to place them beneath or on top of the text layer. The overlay feature comes in handy for positioning comments or correction suggestions without modifying the underlying document. In addition to creating graphics within WordPerfect, you can import EPS, TIFF, and PICT files as well as several DOS graphics file formats.

Powerful Macros

The program's macro editor is truly outstanding. You can record and play back complicated macros and then edit them by using the program's powerful macro language. The language is so powerful that you can create sophisticated miniprograms, complete with custom dialog boxes.

WordPerfect 2.0's automatic features are also impressive. It automatically creates footnotes, endnotes, tables of contents, tables of authorities, automatic cross-references, lists of figures and tables, and multilevel indexes. Alas, you must mark the text to be included in these automatically generated elements, with one lovely exception. WordPerfect 2.0 lets you use a concordance for building indexes. The concordance is a file that contains a list of words to be indexed. The program indexes every occurrence of each word in a document that matches a word in the concordance.

And there's more. WordPerfect 2.0 has sophisticated mail-merge functions and powerful multikey sorting. In addition to a spelling checker, it supplies a built-in, four-level thesaurus. The program's search-and-replace command lets you enter text with formatting codes, but finding and changing formatting without a text string is very difficult. WordPerfect makes up for this shortcoming with a wonderful Find command that searches every WordPerfect document on your Mac for a word or phrase.



WordPerfect 2.0's new drawing tools let you create and edit graphics and colors without leaving the word processor. The Tool palette includes animated pen and fill tools. Click on the fill tool, and the paint bucket pours into the bottle. The pen tool dips in and out of the ink bottle when you use it.

The WordPerfect 2.0 manuals are well written and designed. For those who need additional assistance, the company has excellent technical support. Callbacks are prompt, and there's a toll-free number. The support staff is knowledgeable, patient, and helpful and takes great pains to walk you through simple as well as complicated procedures.

Despite these many and varied strengths, however, WordPerfect 2.0 is not without its share of problems. It's slow, particularly when you're working with multiple styles in a document, and we experienced occasional crashes. As you type, characters often don't display correctly, leaving ghostly bits of garbage on your screen. Type handling isn't much better than Word's: You can kern character pairs in points but not in the more useful fractions of an em space.

Although WordPerfect 2.0 can exchange WordPerfect files with DOS and UNIX machines, it can't import most popular Mac formats. Fortunately, the program has an XTND import filter that handles anything that Claris' XTND technology can translate, so you can bring in simply formatted Word files, for example, if you have the right filters on your Mac. But there's no provision for exporting text to formats other than PC WordPerfect.

And finally, if you rely heavily on structured documents and outlining, WordPerfect 2.0 is probably not for you. The program has no true outline processor, so you can't collapse entire documents into an outline for easy reorganization as you can with Word.

The Bottom Line

With its breadth of features, impressive formatting tools, and outstanding macro capabilities, WordPerfect 2.0 offers more power than any other Mac word-processing program, including Microsoft Word. Unfortunately, it's not always easy to tap that power, nor is WordPerfect's speed on a par with Word's.

On the other hand, WordPerfect excels at handling documents that require multiple, varied-width columns. And if you find yourself switching back and forth frequently between your word processor and your graphics program, WordPerfect's integrated drawing tools will be a welcome time-saver. Overall, WordPerfect offers extraordinary functionality to those willing to decipher its perplexing code system. Moreover, if your organization has already standardized on WordPerfect for the PC, WordPerfect 2.0 will be an excellent addition for Mac users.

— Eric Taub

Get Info

WordPerfect

★★★★

Published by: WordPerfect Corp., 1555 N. Technology Way, Orem, UT, 84057; (801) 225-5000.
Version: 2.0.
List Price: $495.

DISPLAY SYSTEMS

Radius Pivot for Built-in Video and Radius Color Pivot

Radius' latest Pivots offer nature-defying and innovative alternatives to Apple monitors.



Radius' new Pivot monitors, the Pivot for Built-in Video and the Color Pivot, can be driven from the internal video in a Mac IIsi and IIci or from one of Radius' own video cards.

Innovation often appears first as novelty. This was certainly the case with the original Radius Pivot, a gray-scale monitor you could position in either landscape or portrait orientation. Now that Apple has made built-in video circuitry a standard on most of its modular machines, Radius is back with a new pair of Pivots that can be used without a video card. Most notable is the new Color Pivot, a monitor that pushes beyond innovation to defy the laws of nature.

Like the original Pivot, the Pivot for Built-in Video and the Color Pivot can be rotated 90 degrees on the fly, so you can use them in the landscape as well as the portrait position. Each model's screen size is slightly larger than that of an AppleColor High-Resolution RGB Monitor, and it takes only a few seconds for them to refresh their screens after you rotate them. You can operate both units from the 8-bit internal video on a Mac IIsi or IIci: The Pivot for Built-in Video displays a maximum of 16 grays and the Color Pivot a maximum of 16 colors. If you use one of Radius' 8-bit-video cards with the IIsi or IIci, however, the Pivot for Built-in Video can display up to 256 grays and the Color Pivot can display up to 256 colors. However, the Color Pivot doesn't support any 24-bit-video cards.

Radius deserves special credit for the thoughtful engineering that went into its IIsi card. Instead of just filling the IIsi's PDS (processor-direct slot), the Radius board actually includes a PDS, so even if you use the board, you still have an open slot. It's a small touch with a big payoff: It gives you an open socket for a math coprocessor and a 68030 PDS board such as an Ethernet card.

Radius provides driver software for the monitors. And as was the case with the original Pivot, you are advised to heed the warnings in the manuals concerning rotation. The most important prohibition is against rotating the monitor while a dialog box is on-screen. If you ignore this warning, you may end up with a dialog box in which the OK button is clipped off, forcing you to reboot and risk losing data. Even worse, you may damage a file. The manuals clearly describe the known problems, so read them carefully.

One other trait these monitors share with their predecessor is that their screens are shiny and therefore glare-prone. Radius still doesn't provide any option for antiglare coating. Fortunately, Kensington Microware does, offering an antiglare screen for $199.95 (glare protection only, no protection from ELF [extremely low frequency] radiation) that slips over the Pivot bezels, so you get an antiglare screen that fits the Pivots precisely.

Pivot for Built-in Video

Pivot for Built-in Video is Radius' first "second generation" gray-scale Pivot. As its name implies, it's designed for use with any Mac that has internal video circuitry. In our tests, this monitor gave excellent performance, virtually matching Apple's Portrait Display in every respect except glare protection.

The new Pivot's resolution is identical to the Apple Portrait Display's, and its brightness is only slightly (2 footlamberts) less than that of the Apple model. As was the case with the original Pivot, the Radius' focus is softer in the corners than the Apple Portrait Display's and the image is slightly distorted. We also noticed a slight striping on the left side of the display. However, most users won't find these problems significant.

Color Pivot

The Color Pivot is Radius' newest Pivot offering. Until now, rotating a color monitor was considered physically impossible, because the earth's magnetic field forced the electron-beam guns out of alignment when the monitor was turned (see the "Nature of Pivots" sidebar). But the Color Pivot's internal shielding successfully conquers that limitation, and the monitor produces a sharp image in either landscape or portrait orientation. In our tests, the Color Pivot's performance either met or exceeded that of the AppleColor High-Resolution RGB Monitor in almost every case. For the few instances in which the Color Pivot finished second, the differences were insignificant.

The Color Pivot's resolution is nearly double that of the Apple Portrait Display, and its brightness is slightly greater (1 footlambert). Color tracking is excellent and virtually identical to that of the Apple monitor, as is sharpness. We found the focus and geometry identical to that of the Apple model.

The Color Pivot's color guns posed the only problem. Their beams were noticeably misconverged around the edges of the display (that is, the red, green, and blue pixels were not in perfect alignment), and the reds looked more orange and less vibrant than on the Apple monitor. We also noticed a slight jitter on-screen. However, these are minor problems.

The Bottom Line

Choosing between the new Radius Pivots and competing Apple monitors boils down to a consideration of what

you're going to do with the monitor and how much you're willing to spend. Both of the Radius models have higher list prices than do the Apple monitors, although reseller discounting may narrow the gap.

For those who work primarily with word processors and spreadsheet programs, the Pivot for Built-in Video is a good choice over the Apple Portrait Display. It lists for only a few hundred dollars more than the Apple monitor, but with retail discounting, the prices can be very close indeed. The Pivot for Built-in Video's performance is every bit as good as the Apple Portrait Display's, and it has the advantage of letting you configure the monitor for the optimal performance of your principal tasks.

The price difference for the Color Pivot is more significant. At just less than $2,000, the Color Pivot is almost exactly twice the price of the AppleColor High-Resolution RGB Monitor. Even with discounting, the Color Pivot's price is likely to be substantially higher than the Apple monitor's. Still, we found the Color Pivot's shadow-mask design just as sharp as the Apple monitor's design. With its dual orientation, the Color Pivot is an ideal choice for word processing, spreadsheets, graphics, and page layout (even if the closest you come to page layout is positioning a chart on an Excel spreadsheet). Although the lack of 24-bit capability may tip the scale in Apple's favor if you do a lot of photo-realistic graphic work, it's not a limitation for most applications. Despite its higher price, the Color Pivot is worth considering for its versatility and high-quality performance.

With the three Pivot monitors now anchoring its line, Radius offers midsize monitors for most users, successfully making the progression from novelty to innovation.

— Russell Ito and Jeff Pittelkau

Get Info

Color Pivot

★★★★½

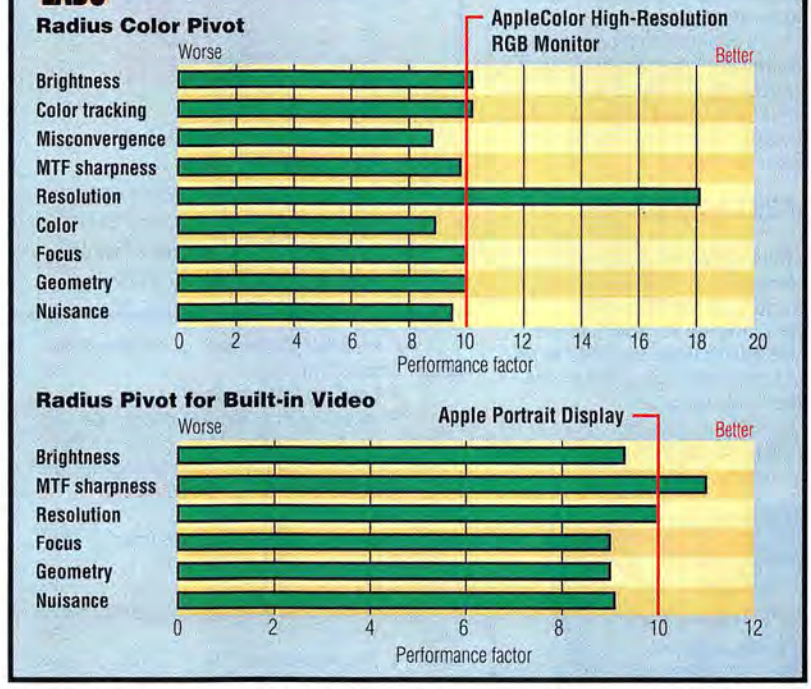
Manufactured by: Radius, 1710 Fortune Drive, San Jose, CA 95131; (408) 434-1010.
List Price: $1,995; optional NuBus, SE/30, IIsi, LC interface card, $795; 2-bit interface for LC, $395; 8-bit upgrade kit, $400.

Pivot for Built-in Video

★★★★½

Manufactured by: Radius, 1710 Fortune Drive, San Jose, CA 95131; (408) 434-1010.
List Price: $1,295; optional NuBus, SE/30, IIsi, LC interface card, $795; 2-bit interface for LC, $395; 8-bit upgrade kit, $400.

MacUSER LABS New Radius Pivots' Performance



We tested the new Pivots with a Mac IIsi, using internal video (16 grays/colors) and Radius' IIsi display card (256 grays/colors). Test images were provided by Larry Pina's Test Pattern Generator (available on Zmac) and MacUser Labs Canvas 2.1 files. For a detailed description of the testing process, see "The Perfect Image: True-Color Displays," May '91, Buyer's Guide page 4.

The Nature of Pivots

The Color Pivot is the first color monitor to successfully defy nature. The story behind this achievement is all about magnetism and how color picture tubes are made. In a CRT (cathode-ray tube), a beam of electrons scans across a phosphor screen. An image is created by modulation of the current applied to this beam. Most common CRTs use a yoke with two electromagnets that deflect the beam horizontally and vertically. At the same time, the earth's magnetic field is also deflecting the beam. To be able to adjust to these forces, the yoke must be positioned very carefully at the factory. Small magnets are glued onto the back of the CRT to further enhance the sharpness (focus) and squareness (geometry) of the display.

Not content to stop with the original gray-scale Pivot, Radius waded into deeper technological waters with the development of the Color Pivot. In a color CRT, three electron beams are precisely fired through holes in a metal mask. The holes are designed to target the beams at the correct phosphor-dot color — red, green, or blue — on a screen's surface. Even more precision and care are required in yoke positioning and magnet adjustment to ensure that the three beams go through the right holes *and* land exactly on their target dots. Lack of precision in this process is called misconvergence.

With its extraordinarily careful design and extensive shielding that insulates the monitor's innards from the earth's magnetic field, the Color Pivot avoids misconvergence. Automatic degaussing (demagnetization) of the CRT and monitor case every time the Color Pivot is rotated helps too.

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4481 StatView II 1.03 309.
SuperANOVA 1.1 *(for Plus/SE or II)* ea. 309.
5907 Statview II/SuperANOVA Bundle . . 569.

★Acius ... 30 day MBG
4D Write 1.0.1 or 4D Calc. . . . ea. 229.
5618 4th Dimension 2.1.1 479.
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★Advanced Software ... 30 day MBG
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7620 *(5 user)* . . 579. 7621 *(10 user)* . . 839.

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★Baseline Publishing ... 30 day MBG
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★Checkfree Corp. ... 30 day MBG
6928 Checkfree Mac 1.5 19.

★CheckMark Software ... 60 day MBG
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5862 Payroll 4.5 175.
5863 MultiLedger 2.0 235.

Claris
1129 MacWrite II 1.1V1 139.



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2796 *Managing Your Money 4.0*–All new interface with version 4.0 makes Managing Your Money even easier! Comes complete with CheckFree electronic bill-paying options as well as multiple small business features **$99.**

8216 FileMaker Pro 1.0V2 215.
1125 MacProject II 2.1V3 359.

★Deneba Software ... 30 day MBG
4700 BigThesaurus 1.0 64.
1768 Coach Professional 3.1 124.

★DeltaPoint ... 60 day MBG
8967 Taste 1.0 83.

Fox Software
5572 FoxBASE+/Mac 2.01 289.
4844 FoxBASE+/Mac Multi-user 2.0 . . . 409.

★Franklin Software ... 30 day MBG
7070 Language Master 2.0 45.

Individual Software
9640 Resume Maker 1.0 26.

Informix
4955 Wingz 1.1A 245.

★Intuit ... 30 day MBG
2425 Quicken 1.5 38.

★Kaetron Software ... 30 day MBG
8941 TopDown 2.1 219.

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2884 Works 2.00D 184.
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5048 EndLink 1.1.3 58.
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7992 DynoPage 1.0 *(April '91)* 72.
6916 Dynodex 2.0 *(April-May '91)* 72.

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★PowerUp ... 30 day MBG

7696 Calendar Creator 1.0 34.
7697 Letter Writer Plus 52.
7694 Address Book Plus 2.0 *(April '91)* . . 57.
7698 Fast Forms 2.0 104.

★Que Corp./RightSoft ... 30 day MBG

7482 RightWriter for the Mac 3.1 54.

Reality Technologies

6929 WealthBuilder 1.0 95.

★Reference Software ... 30 day MBG

6268 Grammatik Mac 2.0 49.

★Satori Software ... 30 day MBG

3320 BulkMailer 3.25 75.

★Sensible Software ... 30 day MBG

3375 Sensible Grammar 1.6 51.

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8810 Informed Manager 1.0 99.
7692 Informed Designer v. 1.1 159.



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6617 KaleidaGraph 2.1 145.

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2986 Timeslips III 2.0E 194.

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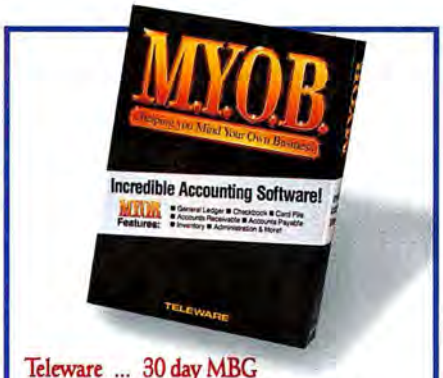
8052 Cheshire 1.0 62.

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6957 Adobe Type Reunion 1.0 38.
5750 Adobe Type Manager 2.0 55.
8794 Adobe Type On Call CD/ATM 47.
6053 Adobe Plus Pack 109.
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3506 SuperPaint 2.0A 135.
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1195 Fontographer 3.2 259.

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1427 The Print Shop 1.3.2 35.
6281 TypeStyler 1.5.2 115.

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1117 MacDraw II 1.1V2 285.
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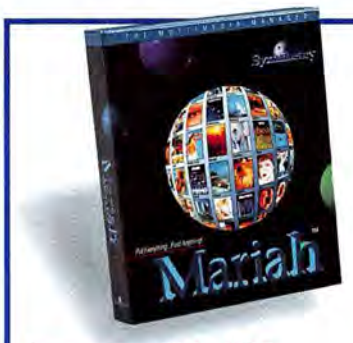
8767 Multi-Ad Creator 2.5 499.

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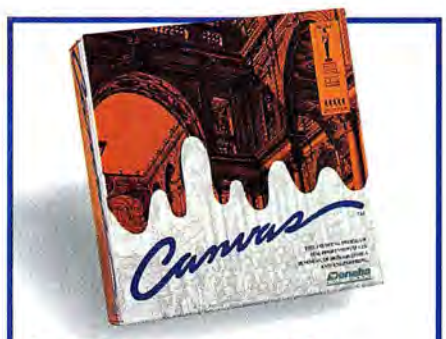


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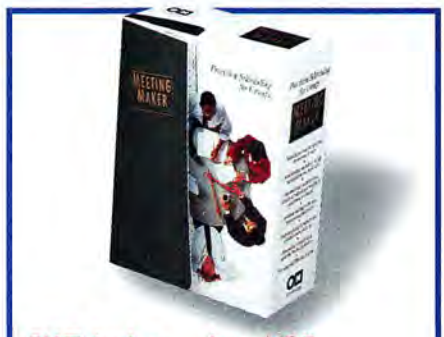
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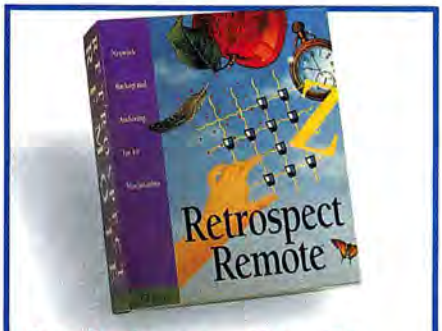
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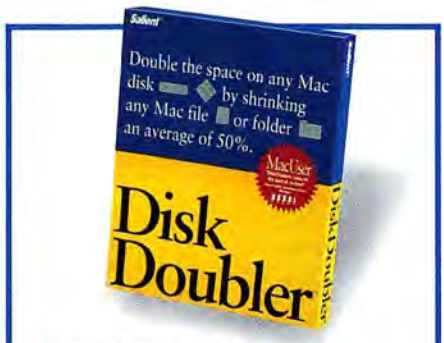


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8266 SimEarth 1.0 40.
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7623 Nemesis Go Master Deluxe 4.7. . . . 85.

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Amanda Stories *(vol. 1, 2 or 3)* . *ea.* 18.

★XOR ... 30 day MBG

8061 MacSki 1.01 39.
6040 MacGolf Classic 1.0 *(CP)* 52.

NETWORKS & COMMUNICATIONS

★Abaton ... 30 day MBG

6266 InterFax 24/96 Modem 349.

Applied Engineering

8365 DataLink Express 175.
DataLink/Mac or Mac Portable *ea.* 209.



CE Software ... 60 day MBG

QuickMail 2.2.3–Power & ease of use have made QuickMail one of the leading E-mail systems for the Mac, with over 350,000 users worldwide. Free upgrade to QuickMail 2.5 *(available this summer).* 5174 *5 Pack*. . . . **$215.** 5173 *10 Pack*. . . . **$315.**

8938 DataLink LC 265.
8362 QuadraLink 209.

★Baseline Publishing ... 30 day MBG

8943 DoubleTalk *(1 Pak)* 79. 8942 *(2 Pak)* 129.

★Beagle Bros. ... 30 day MBG

7691 Flash 1.1. 125.

★CE Software ... 60 day MBG

5174 QuickMail *(5 Pak)* 215. 5173 *(10 Pak)* 315.

★CompuServe ... 60 day MBG

1676 Macintosh Membership Kit 1.03 . . . 22.
1673 CompuServe Navigator 3.0 49.
1674 Membership Kit/Navigator Bundle . 68.

★DataViz ... 60 day MBG

1823 MacLink Plus/PC 5.0 129.
4842 MacLink Plus/Translators 5.0. 109.

Dayna Communications

DaynaTALK *(5 Pak)* 379. *(10 Pak)* 689.
8719 EtherPrint 349.



Int'l. Bus. Software ... 30 day MBG

8581 *DataClub 1.1 (3 user)*–Amazing new concept in file server software. Provides parallel processing performance, centralized server access, and practically unlimited storage–yet requires no dedicated hardware. Simply outstanding! **$199.**

290U

MMC

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Freesoft ... 60 day MBG

6115 *White Knight 11*–A 10 award winning communications program, that supports XMODEM, YMODEM, ZMODEM, Kermit, and CompuServe Error Correcting protocols. Includes Okyto 1.0 and a free subscription to GEnie **$85.**

★Dove Computer ... 60 day MBG

6758 DoveFax Desktop 1.1.1 295.
9634 DoveFax+ 359.

★Dow Jones ... 30 day MBG

5295 News/Retrieval Membership Package 24.

EveryWare

8077 AllShare 1.1.4 139.

★Farallon Computing ... 30 day MBG

9805 Timbuktu 4.0 *(April-May '91)* 136.
4866 Timbuktu/Remote 2.01 135.
6371 Timbuktu/Remote Access Pack .. 925.
8707 Liaison 3.0 279.
6273 PhoneNET StarConnector 10-Pack. 129.
4869 PhoneNET Connector 10-Pk *(DIN-8)* 198.
2206 PhoneNET StarController 300 899.
6687 PhoneNET StarController-EN 1739.
6766 MediaTracks 189.
6768 MediaTracks Multimedia Pack 319.

★Freesoft ... 60 day MBG

6115 White Knight 11 85.

★Global Village ... 30 day MBG

8946 TelePort A300 139.
8945 TelePort/FAX 169.

Hayes

2300 Smartcom II 3.2 84.
2307 Smartmodem 2400. 349.
7391 Ultra 9600 Modem 799.

Insignia Solutions

7557 Access PC 1.1 62.
7058 SoftPC-AT/EGA Module 124.
4089 SoftPC 1.3 245.

Intel Corporation

5119 2400EX Modem 179.
6420 2400EX MNP Modem. 229.
8193 9600EX Modem *(w/QuickLink II)*. . 549.

★Int'l Business Software ... 30 day MBG

8581 DataClub 1.1 *(3 user)* 199.
8580 DataClub 1.1 *(10 user)* 539.

★Kennect Tech. ... 30 day MBG

5631 Rapport 1.3.4 195.
7588 Drive 360 *(5¼")* 249.
7590 Drive 1200 *(5¼")* 249.
5632 Drive 2.4 *(3½")* *(incl. FastBack II)* . 325.

★Microcom ... 30 day MBG

7465 CarbonCopy Mac *(Twin Pak) special* 139.
8027 MacModem V.32 689.

★Microsoft ... 30 day MBG

9444 Microsoft Mail 3.0 *(1-5 user)* 269.

★Nuvotech ... 60 day MBG

3000 TurboNet ST *(DIN-8)* $30.
6272 NuvoLink SC 389.

★Orchid Technology ... 30 day MBG

6949 OrchidFAX Modem 1.06 419.

★Practical Peripherals ... 30 day MBG

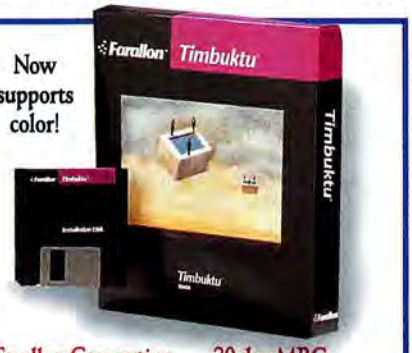
3102 2400 Baud External Modem 179.
8994 2400 V.42 bis Modem. 209.
7934 PM9600SA Modem 1.26 489.
3089 Mac Communications Pack 225.

★Prometheus ... 30 day MBG

8350 2400 Mini for Mac 149.
8348 24/96 Minifax 189.
8349 Maxfax 289.
8709 2400M Plus. 219.
8738 9600M Plus 599.
8990 ProModem Ultima 689.

★Shiva ... 30 day MBG

3444 NetSerial 3.3. 275.
NetBridge or TeleBridge *ea.* 409.
3443 NetModem V2400 3.3 339.
6917 NetModem V.32 *(V.42 & V.42 bis)*. 1169.
6519 EtherGate 1619.
8189 FastPath IV 1889.



Farallon Computing ... 30 day MBG

9805 *Timbuktu 4.0*–This new version of the leading remote control software now supports color and provides clipboard exchange and full background file transfer. Also has multiple window capability. **$136.**

Sitka/TOPS

4188 TOPS Teleconnector *(DIN8)* 23.
3720 TOPS Flashcard 155.
6264 TOPS Networking Bundle 3.0 187.

★Software Ventures ... 30 day MBG

3455 MicroPhone II 3.0 215.

★Solutions, Inc. ... 60 day MBG

6720 FAXGATE Plus 1.1.2 239.

★Synergy ... 30 day MBG

6618 VersaTerm 4.5. 87.
6619 VersaTerm-PRO 3.5. 173.

★Traveling Software ... 60 day MBG

3729 LapLink Mac III Connectivity Pac . . 93.

INPUT/OUTPUT

★Abaton ... 30 day MBG

7432 Scan 300/GS *(reqs. Scan Kit)* 999.
Includes free ProPoint ($79 value).

American Power

5895 UPS 110SE 209.
6686 UPS 370ci 339.

Apple Computer

9771 StyleWriter & Ink Cartridge 559.



Baseline Publishing ... 30 day MBG

7784 *Color MacCheese 1.05*–Affordable 32-bit color painting. Perfect for the Mac LC ... **$56.**
7785 *Talking Moose 3.0*–Jokes, humor & more 23.
8055 *Screenshot 1.2*–The one-step screen graphics solution 30.

Applied Engineering

9799 Cache-In. 199.

Caere

8124 Typist 479.
4476 OmniPage 2.12. 495.
OmniSpell 1.0 or OmniDraft 1.0 *ea* 69.

CH Products

7344 Rollermouse ADB 75.

Chinon

8814 DS-3000 Scanner w/Dig. Darkroom 699.
8815 DS-3000 Scanner w/OmniPage . . 1069.

Computer Friends

8271 ColorSnap 32+ 649.

★CoStar ... 30 day MBG

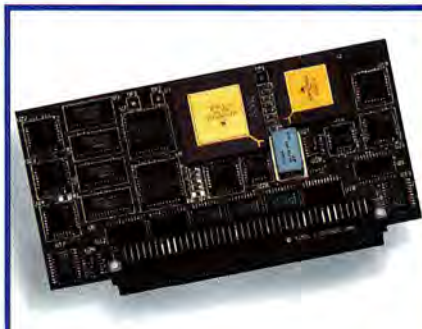
6090 LabelWriter 179.
7452 LabelWriter Labels *(12-Pak)*. 49.

★Datadesk ... 30 day MBG

6901 Switchboard *(modular keyboard)* . 159.

★DayStar Digital ... 30 day MBG

Listed items do not include coprocessor.
LT200 Connection *(PC) 189. (MC)* 299.
8556 FastCache for Mac IIci 279.
8586 40 MHz PowerCache IIci. 949.
8585 50 MHz PowerCache IIci. 1689.
8583 SCSI PowerCard 1095.



DayStar Digital

PowerCache IIci–Go faster than a Mac IIfx! New 40 and 50 MHz turbocharged cache cards for the Mac IIci. Turns your computer into the fastest Mac alive! ... **see line listing.**

PRINTERS

CrystalPrint Express

For impressive speed at an affordable price, nothing beats the CrystalPrint Express PostScript laser printer.



The Qume CrystalPrint Express is built to withstand the demands of large networks and high-capacity stand-alone printing.

The CrystalPrint Express is, quite simply, the fastest desktop laser printer you can buy. But in addition to sheer speed, the PostScript-compatible $5,595 Express features quality output, impressive paper handling, and a small footprint, making it a worthy choice for large networks as well as high-capacity stand-alone printing.

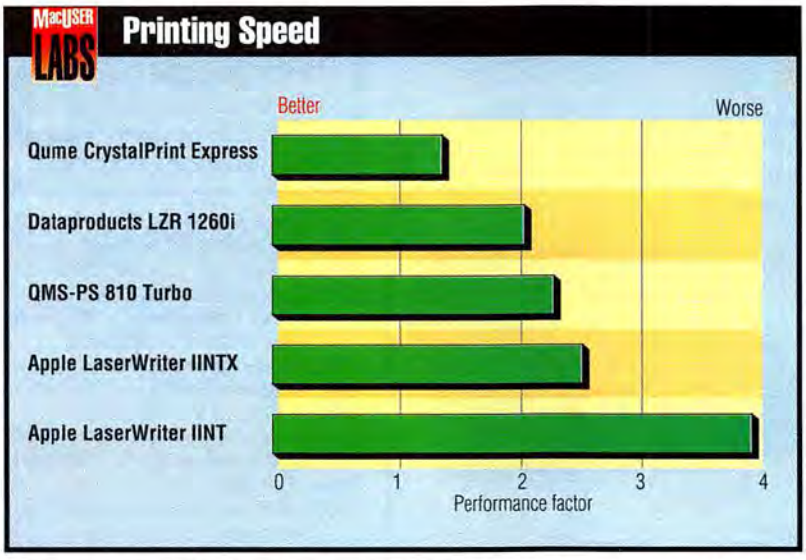
Blistering Speed

To test CrystalPrint Express' speed, we used the benchmarks that were created for the MacUser Labs report on PostScript printers (October '90, page 89). Our tests clocked the Express at nearly twice the speed of Apple's fastest laser printer, the $5,995 LaserWriter IINTX. Even more impressive, the Express also bested the performance of both the $5,995 Dataproducts LZR 1260i and the $5,495 QMS-PS 810 Turbo, two of the fastest printers in the MacUser Labs report.

To ensure that you're as happy with the Express' output as you are with its speed, the Express features two horizontal-resolution settings of 300 dpi and 600 dpi. The higher setting smooths out curves and makes characters more legible, but to use it, you must increase the printer's memory to 6 megabytes (which adds $1,000 to the price). To the Express' credit, you won't see any degradation in the printer's speed when printing at 600 dpi.

What makes the CrystalPrint Express so fast is its Weitek XL-8200 6-megahertz RISC processor. A printer equipped with a RISC processor is likely to be faster than a printer that uses a multitasking processor such as the Motorola 68000 series used in Adobe PostScript printers, because the RISC processor is more efficient for printing tasks. Adobe has announced that PostScript has been ported to several RISC processors, including the Weitek chip, but we've yet to see any RISC-based desktop Adobe PostScript printers.

The Express handles both straight text and more-complex documents with ease. Text documents put a lot of demand on a printer's engine, and their printing speed is boosted by the Express' 12-ppm (pages per minute) Sanyo engine. By contrast, the Apple LaserWriter IINTX uses an 8-ppm engine. More-complex documents are processor-intensive, and the Express' RISC processor makes short work of those documents as well.



The Express streaks by printers from Apple, QMS, and Dataproducts. Performance factors are the combined results of MacUser Labs' PostScript-printer benchmark tests, which use a 25-page Word document and Excel, Illustrator, and MacDraw files.

Clumpy Characters

The CrystalPrint Express uses proprietary PostScript-compatible code originally developed by Weitek. The code poses one slight problem, however: It can't read the hints in Adobe Type 1 fonts. Hints improve the shape of characters in small point sizes at 300-dpi resolution. Unfortunately, the Express causes some characters to clump at 12-point sizes and smaller when you use downloadable Type 1 fonts. On the plus side, the printer's 35 resident Bitstream fonts have their own hinting scheme, so the legibility of standard fonts such as Helvetica and Times does not suffer at any size. The Express compensates for its lack of hints with the 600-dpi setting, which solves the clumping problem somewhat.

The Express delivers industrial-strength paper handling and comes standard with two 250-sheet paper trays. It offers manual feed, which we found a bit awkward, and faceup or facedown output.

Qume has made upgrading the Express a snap. All of the printer's PostScript code is on a single modular circuit board that you can access by removing a side panel.

need in a flash.

25 MHz PowerCard 030 *(II,IIx,IIcx)ea.* $1095.
40 MHz PowerCard 030 *(II,IIx,IIcx) ea.* 1389.
50 MHz PowerCard 030 *(II,IIx,IIcx) ea.* 1895.

★Dove Computer ... 60 day MBG

Marathon Racer 030 Plus or SE *ea.* 599.
9789 Marathon Racer 030 II 1079.

GDT Softworks

6256 PrintLink Collection 4.0 59.
6151 JetLink Express 2.1 89.
8960 ParaLink Express 99.

Hewlett-Packard

6514 HP DeskWriter Printer 759.
6754 HP LaserJet III *(with toner)* 1699.
9355 HP LaserJet IIP *(with AppleTalk, 1 Meg & PostScript Cartridge)* . . . 1799.

Hitachi

9492 14" Color Monitor *(includes 15-pin adaptor for Mac II)* 599.

★Kensington ... 30 day MBG

Turbo Mouse 3.0 *(Plus or ADB) ea.* 107.

Kodak

6730 DICONIX M150 Plus Printer 399.

★Kraft Systems ... 60 day MBG

7519 KM30 ADB Joystick 42.

★Logitech ... 30 day MBG

5082 ScanMan Model 32 G-Scale Scanner 299.



MegaGraphics
19" Rival Monochrome System for SE, SE/30 or II–*Macworld* Editors' Choice in large screens. Also includes coupon book with over $3000 in savings on special 3rd party products. **ea. $1199.**

MegaGraphics

16" 8-bit System for SE/30 or II *ea.* 2595.
7841 16" 24-bit Color System for Mac II 4895.
19" Rival Sys. SE, SE/30, or II . *ea.* 1199.
19" 8-bit System for SE/30 or II *ea.* 4295.
7840 19" 24-bit Color System for Mac II 6395.
19" G/S System for SE/30 or II *ea.* 1895.

★Micron ... 30 day MBG

7149 Xceed IIci-128 Cache Card 239.
6680 Xceed for SE/30 *(640 x 480)* 329.

★MicroSpeed ... 30 day MBG

6620 MacTRAC 59.
6621 MacTRAC ADB 69.

★Mouse Systems ... 30 day MBG

7560 Trackball ADB 68.
Little Mouse or Little Mouse Plus . *ea.* 74.
9471 A³ Mouse 85.

★Nutmeg Systems ... 30 day MBG

15" Monitor: SE, SE/30, II or IIsi *ea.* 599.
19" Monitor: SE, SE/30, II or IIsi *ea.* 995.
19" Monitor: G-Scale SE/30, II, IIsi *ea.* 1295.
20" Color System: SE/30, II, IIsi *ea.* 2595.



Applied Engineering
9799 *Cache-In*–Cache-In on IIci performance with Applied Engineering's cache card. Cache-In gives your Mac IIci increased speed of up to 40% with high reliability, low power consumption and low price **$199.**

★Orange Micro ... 30 day MBG

3036 Grappler 2.0 *(9 pin)* 92.
6229 Grappler LX 134.

Pacific Data Products

7412 Pacific Page PE 4.0 for the Mac . . 529.

Passport Designs

3115 MIDI Interface 75.
9508 MIDI Cables *(Qty. 2)* 12.

RasterOps

8526 Video Expander 529.
7469 ColorBoard 264 for SE/30 679.
8944 RasterOps 24STV 1299.
Business Color System: SE/30 or II 2995.

★Sophisticated Circuits ... 30 day MBG

8009 PowerKey 64. 8008 Wake-Up Cable 32.

TheComplete PC

6104 Half-Page Scanner/400 289.

Thunderware

4994 LightningScan 400 385.

★Total Systems ... 30 day MBG

8653 Galileo I Video Board *(for Mac SE)* 449.
9282 Galileo I Video *(for Mac Plus)* 449.
8989 High Speed SCSI for Mercury 16+ 189.
7817 16 MHz Mercury 030 *(for Mac SE)* 389.
8624 16 MHz Mercury 030 *(for Mac Plus)* 519.



Prometheus ... 30 day MBG
8990 *ProModem Ultima*–The only 14,400 bps (V.32bis) modem with 9600 bps send/receive fax capability and all the software you need. Ideal for use with remote access programs like Timbuktu/Remote **$689.**

7816 20 MHz Gemini 030 $799.
8708 25 MHz Gemini 030 w/o copro. . . 1179.
7814 33 MHz Gemini II 030 1375.
8371 40 MHz Gemini II 030 1499.

MEMORY & DRIVES

SIMMs ... 2 year warranty
Includes free instructional video tape.

1107 1 Meg SIMMs *(80ns)* 57.
8316 2 Meg SIMMs Set *(80ns)* 99.
9437 2 Meg SIMM for IIsi *(2 - 1 Meg SIMMs)* call
7497 1 Meg SIMMs for IIfx *(set of 4)* 239.

Applied Engineering

8362 QuadraLink 205.
8361 1.44 Meg High Density Drive 229.
MacRam Classic with 0, 1, or 3 Mb. call

★Cutting Edge ... 30 day MBG

3989 800K External Disk Drive . *special* 119.
5133 20+ Meg Hard Drive 329.
3990 30+ Meg Hard Drive 389.
3991 45+ Meg Hard Drive 439.
5275 60+ Meg Hard Drive 489.
5276 80+ Meg Hard Drive 529.
5456 45 Meg Removable Drive 599.
5736 45 Meg Removable Cartridge 79.



Cutting Edge ... 30 day MBG
3989 *800K External Disk Drive*–Low cost, reliable 800K external floppy drive. Reads both 400K and 800K disks; includes eject button and busy light. A great drive at a great price! **$119.**

Dayna Communications

8723 DaynaFILE 360k Drive 449.
8722 DaynaFILE 1.2 5¼" Drive 449.
8724 DaynaFILE Dual 360k & 1.44 Mb . 739.

★Dove Computer ... 60 day MBG

MaraThon 030 Upgrades . . . *ea.* 399.
8186 MacSnap 524XE 199.
8187 MacSnap 524XS *(w/SCSI Port)* 249.
8649 MacSnap 596XE *(4 Mb)* 299.
8652 MacSnap 596XS *(4 Mb w/SCSI Port)* 365.

★Fifth Generation ... 30 day MBG

9809 FastBack Tape 999.
9403 JukeBox Five *(auto disk feeder)* . . . 155.

Iomega

7551 44 Meg Transportable *(reqs. kit)* . . 929.

Peripheral Land, Inc. (PLI)

8335 PLI TurboFloppy 1.4 309.
8334 PLI SuperFloppy 429.
8333 PLI Sony 40 Turbo Ext. Drive 439.
8327 PLI Infinity 40 Turbo 739.
8330 PLI 105 Meg Ext. Drive 699.
8329 PLI 200 Meg Ext. Drive 1179.

Overnight. $3.



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Cutting Edge Hard Drives are fast and reliable with access times as low as 23 milliseconds and a mean time between failure rating of up to 100,000 hours. An outstanding combination of quality and low price. **see line listing.**

Quantum

40 Meg & 80 Meg Internal Drives for Mac SE, SE/30, IIx, IIfx, IIci & IIcx . . call

★Total Systems ... 30 day MBG

68882 Math Coprocessors call

ACCESSORIES

Apple Computer

7748 Personal LaserWriter Toner Cart. . . . 89.
1115 LaserWriter II Toner Cartridge 105.

★Avery ... 60 day MBG

4807 Laser Labels 1" x 2⅝" *(Qty. 3000)* . 24.
5392 Disk Labels 3½"-*Laser (Qty. 630)* . . 29.

★Basic Needs ... 60 day MBG

Nylon Dust Covers. 10. to 13.
7413 Mac IIcx/ci Monitor Stand 48.

★Computer Coverup ... 60 day MBG

9501 Mac LC w/12" Monitor Cover 10.
1725 Mac SE Ext. Keyboard Cover set. . . 10.

★CoStar ... 30 day MBG

7453 The Organizer Jr. 82.
6091 The Organizer. 199.

★Curtis Manufacturing ... 30 day MBG

8046 MVP Mouse 89.



Insight Development ... 30 day MBG

6171 *MacPrint 1.23*–Lets you use any HP printer with your Mac. For a limited time, buy MacPrint 1.23 and get MacEnvelope 4.2, an envelope printing utility, absolutely free . . $93.

★Goldstein & Blair ... 30 day MBG

8198 "What Do I Do Now" Book $9.
8374 The Macintosh Bible *(w/disk)* 25.
9283 The Macintosh Bible/"What" Bundle 30.

★I/O Design ... 30 day MBG

Available in black (listed) or blue.

8812 Ultimate Classic Carrying Case. . . . 64.
6129 Ultimate SE/Ext. Carrying Case. . . . 79.

★Kensington ... 30 day MBG

Full line available. Partial listing.

2559 Apple Security Kit 33.
9303 Keyboard Shelf 39.
6763 SE Radiation/Anti-Glare Filter 52.
2566 System Saver Mac *(platinum)* 63.
5064 Apple Color Monitor Polarizing Filter 63.
PassProof *(specify right or left)* 65.

★MacConnection ... 60 day MBG

4623 Solid Oak Disk Case *(holds 90 disks)* 32.
8795 Switch Box *(2 Pos.)* 32. 8796 *(4 Pos.)* 49.

★Mobius Technologies ... 60 day MBG

4470 Fanny Mac QT *(Platinum)* 53.

★Moustrak ... 60 day MBG

2694 Moustrak Pad *(7"x9")* 8. 2692 *(9"x11")* 9.
2693 Moustrak Pad L/F *(large 9" x 11")* . . 10.



Custom Applications ... 30 day MBG

8037 *Freedom of Press Light 3.0*–Print PostScript text & graphics files on non-PostScript printers. This award-winning software includes 17 outline fonts & supports ATM & Type 1 fonts. . . $55.
6517 *Freedom of Press 3.0 (35 fonts)*. 255.

Ribbons

3255 Image II Black . 4. 9362 *(12 Pak)* . 29.
3261 Image II Multi-4-Color 9. 9810 *(6 Pak)* 39.

★Sopris Softworks ... 60 day MBG

Ripstop Nylon Dust Covers call.
4014 High Trek Mac SE & Ext. Kybd. Case 69.

★Targus ... 60 day MBG

3617 Mac Plus/SE Case *(fits classic)* 59.
4015 Mac SE & Ext. Kybd. Carry Case . . 75.

★Tripp Lite ... 30 day MBG

6199 Isobar 4 *(surge suppressor, 4 outlets)* 49.
6200 Isobar 6 *(surge suppressor, 6 outlets)* 59.

STORAGE MEDIA

★Sony ... 60 day MBG

3297 3½" DS/DD Disks *(10)* 12.
6148 3½" DS/DD Disks 3 Pak *(30)* 29.
3298 3½" HD Disks 1.44 Meg *(10)* 19.
6375 3½" HD Disks 3 Pak *(30)* 49.
8185 QD2040 Tape Cartridge 19.

★MacConnection ... 60 day MBG

6592 44 Meg Removable Cartridge 74.
9728 44 Meg Removable Cart. *(10 Pak)*. 699.



Global Village ... 30 day MBG

TelePort A300–1990 MacUser Editors' Choice Award for *Best Communications Product*. 2400 bps/MNP-5 modem connects via ADB Port. SendFax (9600 baud) optional.
8946 *Basic* . . **$139.** 8945 *with FAX* . . **$169.**

★MAXELL ... 60 day MBG

2792 3½" DS/DD Disks *(10)* 13.
2793 3½" HD Disks 1.44 Meg *(10)* 21.

★3M ... 60 day MBG

3943 DC2000 40 Mb Data Cartridge 19.

OUR POLICY

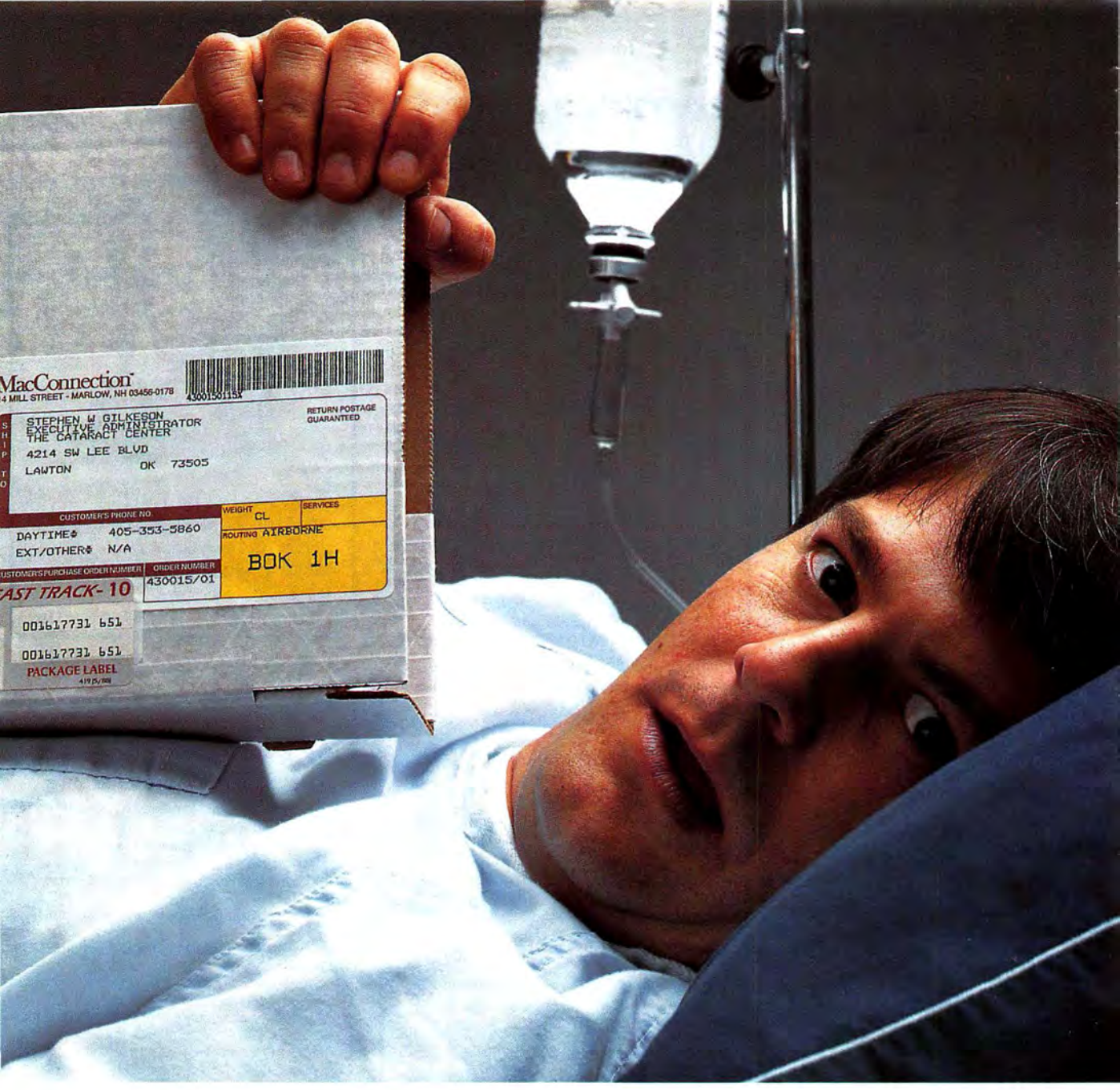
- We accept VISA and MASTERCARD.
- No surcharge added for credit card orders.
- Your card is not charged until we ship.
- If we must ship a partial order, we never charge freight on the shipment(s) that complete the order (in the U.S.).
- No sales tax, except Ohio residents (please add applicable tax).
- All U.S. shipments insured; no additional charge.
- APO/FPO orders shipped First Class Mail.
- International orders U.S. $250 minimum.
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- Corporate P.O.s accepted subject to credit approval.
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Continental US: Barring events beyond our control, all credit card orders phoned in weekdays by 3:15 AM EST will ship Airborne Express for delivery the next business day. Which means *same day* delivery for orders placed between midnight and 3:15 AM EST. (Some orders may ship by UPS Ground for next day delivery). Saturday delivery available to many areas upon request. Some areas require an additional day delivery. The total freight charge on any order placed with MacConnection is only $3.

Hawaii, Alaska, Canada, Puerto Rico and U.S. Virgin Islands: Call 800/334-4444 for information on shipping and charges.

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"Fast deliveries may require immediate medical attention."

Dear MacConnection,

As a large outpatient surgical center, our doctors and nurses are trained to handle medical emergencies. Fortunately, they were able to stabilize my vital signs when I received software from you after only 12 hours! Last night at 11:00 I placed an order. I was totally overwhelmed when it arrived on my desk before 10:30 this morning. Once again you have proven to me that your company is the best in the business. One suggestion, though. Maybe you can place a label on the shipping container that says, "WARNING: Fast deliveries may require immediate medical attention."

Stephen W. Gilkeson
The Cataract Center of Lawton, OK

1-800/334-4444

MacConnection®

MacConnection, 14 Mill Street, Marlow, NH 03456 603/446-7711 FAX 603/446-7791

Just for the record, all the ads in this series feature photographs of real live MacConnection customers and the real live letters they wrote us. Really!



Our New Departmental PostScript Printer Is So Efficient, You Might As Well Say It Prints Money.

Efficiency – The QMS Watchword Of The '90s

Maintaining one high-duty printer rather than 30 to 40 desktop printers is a cost advantage. That's good. But the real advantage comes when the speed, intelligence and flexibility of the new QMS-PS® 2000 changes an office cost advantage into a departmental profit center!

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The QMS-PS 2000 is perfect for mixed computing environments. It connects easily to EtherNet® or Token Ring® networks to accept TCP/IP, DECnet®, LAN Manager, NetWare® and EtherTalk™ protocols†. Whether your network includes IBM® PC's and compatibles, Macintosh®, DEC® or UNIX® systems, the QMS-PS 2000 is your most efficient solution. It features AppleTalk®, RS-232 serial, Centronics®/Dataproducts® parallel and network interfaces that accept data simultaneously. That means the PS 2000 can easily serve large, multi-system networks. Its advanced spooling capability virtually eliminates workstation waiting time by storing each document as it's received and printing each in turn. And the PS 2000 does all this automatically to save time!

True Adobe PostScript Flexibility Plus Automatic Emulation Switching

Now departmental documents can have personality thanks to the PS 2000 and Adobe® PostScript®. Forty-five resident fonts can be scaled and rotated for effective charts and graphs. And because PostScript is the industry standard, you'll have thousands of useful applications at your fingertips. Switching to non-PostScript applications is literally automatic. QMS's exclusive ESP* technology (Emulation Sensing Processor) interprets incoming data and automatically chooses the appropriate printer language. PostScript, HP® LaserJet® Series IIP. HP-GL®, LN03® Plus and other emulations are recognized automatically!



Worldwide Service And Support

QMS® is recognized as the leader in advanced PostScript printing technology. Free technical support and our network of service experts are standing by.

Call today and find out how the time-efficient, cost-efficient QMS-PS 2000 can be a departmental profit center for your company. Or FAX QMS Product Information at **(205) 633-4866.**



POSTSCRIPT®

Features That Add Up To Lower Per-User Cost

- MIPS R3000 RISC-based internal controller for super-fast page processing
- 8 MB RAM standard, expandable to 16 MB
- 1.44 MB, 3 1/2" floppy drive to load fonts or emulations into RAM or onto hard disk
- QMS proprietary ASAP™ IV technology speeds PostScript processing time
- 20 pages per minute
- 70,000 plus page-per-month duty cycle
- 1500 sheet input and output capacity
- Letter-/A4-, legal, 11"x17"/A3- and executive-size printing capabilities
- Duplexing feature prints on both sides in one pass
- Easy-to-read, multilingual LCD front panel to easily configure printer
- Document handling features include signature printing, tumble printing, collation, offset stacking, lay-up and number-up printing

1-800-523-2696 EXT. 204

QMS™

Where Imagination Leads

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To upgrade when new code revisions become available, you just pop out the old board and plug in the new. However, extra memory, which you can upgrade 1 megabyte at a time (to a maximum of 8 megabytes), must be installed by a dealer.

The Express comes with three interface ports: LocalTalk, serial, and parallel. Unlike the QMS-PS 410, however, the Express does not provide auto-switching of ports for mixed Mac-and-PC printing environments. For using the Express with a PC, Qume provides Hewlett-Packard LaserJet emulation that you either automatically switch to by downloading software or set through the printer's front panel. The lack of a SCSI interface is disappointing, because you can't attach a hard drive to store downloadable fonts.

The Express' consumables come in three units: toner, developer, and drum. You replace each unit separately. This approach costs about the same but is harder to deal with than the single replacement cartridges that come with Canon-engine-based laser printers, but then Canon doesn't make an engine faster than 8-ppm. You may be frustrated the first time you replace the Express' consumables, but overall this is a small price to pay for a printer that's so fast and versatile.

The Bottom Line

MacUser Labs has tested more than 100 PostScript printers. At $5,595, Qume's CrystalPrint Express actually costs less than some competing printers that are neither as fast nor as versatile. The Express distinguishes itself as the fastest desktop laser printer we've seen, but its lack of a SCSI port for downloadable-font storage and missing support for Adobe Type 1 hints reduce its rating to slightly less than perfect. These shortcomings aside, the Express' paper-handling muscle, bargain price, and blistering speed make it an excellent choice for the most demanding of printing environments.

— Paul Yi

Get Info

CrystalPrint Express

★★★★½

Manufactured by: Qume Corp., 500 Yosemite Drive, Milpitas, CA 95035; (408) 942-4000.

List Price: 3 megabytes, $5,595; 6 megabytes, $6,590.

DATABASES

4D Write, 4D Calc, 4D XREF

Three plug-in tools add a word processor, spreadsheet program, and database analyzer to 4th Dimension.

If you thought integrated software for power users was a dead issue, think again. ACIUS has released two add-in modules for its powerful 4th Dimension database program that provide developers and users with word-processing and spreadsheet capabilities from within 4th Dimension. A third new module, 4D XREF, is an excellent developers' tool for tracking and analyzing database functions and designs.

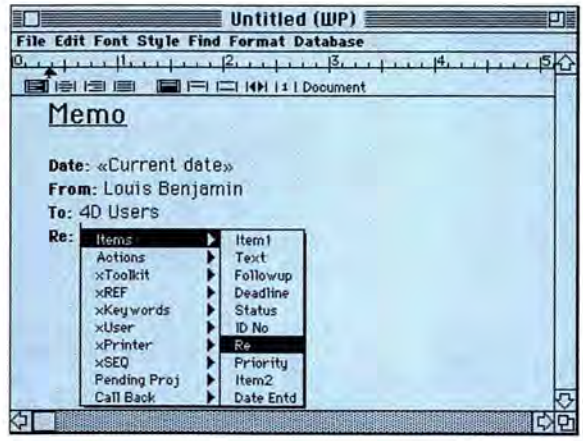
Precision Tooling

4th Dimension and HyperCard were the first two Mac applications designed to use external code resources as if they were built in to the programs. ACIUS has made good use of this design with its 4D Write word processor and 4D Calc spreadsheet program, both of which use 4th Dimension's engine and language. The modules are actually superexternals, which means they come with their own menu bars and a suite of language commands that are installed in the 4th Dimension developer environment. They're so finely fitted to 4th Dimension that they plug in to the database program with the crisp click of precision-milled parts.

The result is a level of integrated functionality among the three products that you can't get with any other add-in or stand-alone application. A close look at Excel, for example, shows that its database functions don't compare well with the functionality of most other low-end database products. 4D Write and 4D Calc, on the other hand, compare very well indeed with low-end word processors and spreadsheet programs while at the same time offering seamless integration with 4th Dimension.

What makes the modules so powerful is that they directly reference fields in a 4th Dimension database. One of the most exciting features is the modules' hot-link capability. 4D Write; 4D Calc; and another add-in to 4th Dimension, 2D Graph, all share data directly. You can create a spreadsheet that draws data from fields in the database. Then you can a link a range of the spreadsheet to a 2D Graph chart and link that chart in turn to a 4D Write document. The document draws its format from the file structure and its data from the files in your sophisticated relational database. Because the links are "hot," changes in the data or in the format automatically ripple through the entire chain. You can also use the modules to do mail-merges and to create intelligent documents.

As the database designer, you have ultimate control over the use of the modules within the applications you develop. You can add them to applications for your own use but restrict others from accessing them. Or you can create free-floating windows with their own menu bars within applications and give users varying degrees of interaction with 4D Write or 4D Calc.



4D Write, an add-in module to ACIUS' 4th Dimension, provides basic word-processing functions. A hierarchical pop-up menu makes it easy to insert database fields into documents.

After 20 Million Pages Of PostScript Color Output, The Last One Looks As Great As The First.



MacWorld World Class Award
September 1990

PC Magazine Editors Choice
November 14, 1989

POSTSCRIPT®

Features That Will Color Your Perception Of Business And Design Forever

- Compatible with Macintosh computers, IBM PC's and clones and other popular systems
- 35 resident Adobe PostScript typefaces all scalable and rotatable
- Model 30*i* has standard 8 MB RAM/1 MB ROM
- Model 10 has standard 5 MB RAM expandable to 8 MB RAM
- Model 10 prints letter- and legal-size paper and transparencies
- Model 30*i* prints letter-size and 11" x 17" paper and transparencies
- AppleTalk®/RS-422, RS-232 serial and Centronics® parallel interfaces provide compatibility with most micro, mini, mainframe and workstation hosts
- External SCSI interface supports up to seven additional hard drives of unlimited size
- 68020 MPU-based controller plus exclusive QMS ASAP™ technology means fast first-page-out performance
- Prints high-quality Adobe PostScript text and graphics at 300 x 300 dots per inch
- HP-GL® emulation software included

QMS ColorScript Printers... Brilliant *and* Resilient

Since 1987, QMS ColorScript™ 100 printers have produced over 20 Million hard copies and transparencies around the world! And because this color technology is engineered to use new ink with each print, the last page literally looks as bright and true as the first. This reliable QMS® technology has been united with the industry standards of Adobe® PostScript® and PANTONE®* Color to put exciting, persuasive color at your fingertips page after page.

Presenting The ColorScript Model 10 Printer

If it's dynamic presentations you're after, you need the Model 10. From business presentations to training programs, the Model 10 delivers vibrant, visually exciting colors that help you communicate ideas clearly. QMS screen angling technology and special presentation inks make these unusually captivating colors possible. And it's a proven fact that color presentations increase audience information retention and raise a recipient's tendency to act upon the information. So, in today's competitive business environment, the key question becomes, "Can we afford *not* to have the power of color?"

The ColorScript Model 30*i* Printer, Strictly For The Image Conscious

Extremely low cost Pantone-approved proofs in about 60 seconds. If you're a graphic designer, commercial artist or publisher it's easy to see how the Model 30*i* is revolutionizing your business. The QMS ColorScript 100 Model 30*i* is changing the relationship between speed, quality and cost by allowing you to do your job faster, cheaper *and* better!

The Model 30*i* is the first true "what-you-see-is-what-you-get" color printer. The colors you see on a Pantone-approved monitor are the same colors you'll see on a Model 30*i* proof *and* the same colors you'll see on the finished, printed piece. And the standard 11" x 17"/A3 paper handling capacity allows you to design actual size 8 1/2" x 11" full bleed proofs with crop marks.

True Adobe PostScript Guarantees Compatibility

Since Adobe introduced the PostScript page description language in 1984, it's become the industry standard for electronic printing and publishing. And with the QMS ColorScript 100 Model 10 and Model 30*i*, you get guaranteed compatibility and consistency. PostScript imitations, on the other hand, may not be 100 percent compatible with Adobe's PostScript.

Two Top Performers Right Out Of The Box

Whether you choose the Model 10 or the Model 30*i* you can be up and running within minutes. Both printers are designed for maximum compatibility with Macintosh® computers, IBM® PC's and compatibles as well as many other systems. And, for additional support, QMS's technical and service professionals are standing by to assist you with answers that will get you up to speed fast. Call us today and we'll help you decide which printer best suits your needs. Or FAX QMS Product Information at **(205) 633-4866.**

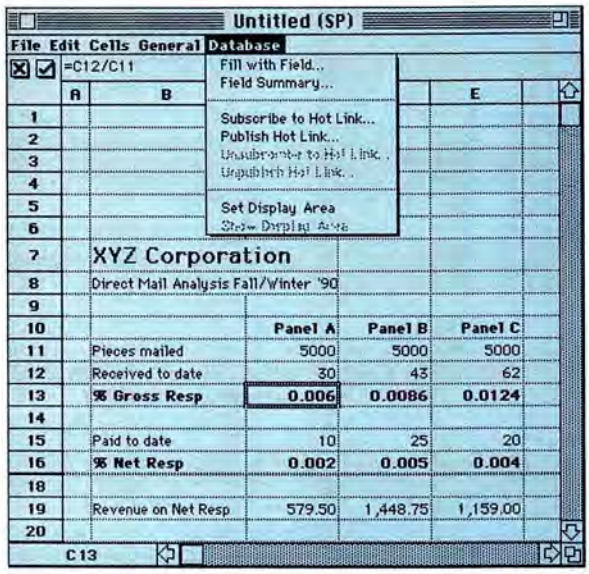
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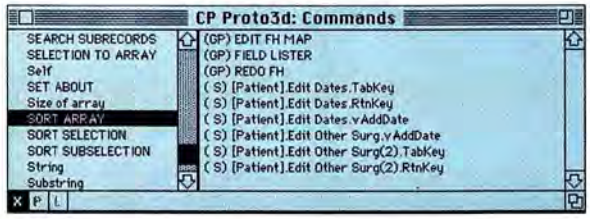
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4th Dimension's add-in spreadsheet program, 4D Calc, lets you create hot links between 4D Calc spreadsheets and 4th Dimension databases.



4D XREF helps database developers manage their designs.

4D Write and 4D Calc

You need 4th Dimension version 2.1.1 or later to use 4D Write and 4D Calc. Although 4D Write and 4D Calc are both serviceable applications, you probably won't want to use them as replacements for your full-blown word processor or spreadsheet program. 4D Write compares well with MacWrite II and Write Now. It features text formatting, rulers, and paste-in graphics but has no built-in style sheets and no spelling checker. It also has difficulty opening large text files. And although 4D Write lets you save documents in RTF (rich text format), it doesn't do a good job of translating imported RTF documents.

If you've ever tried to summarize data and export it to Excel, you'll welcome 4D Calc. What's more, 4D Calc allows two-way data flow, so the values of individual cells in 4D Calc spreadsheet models can be extracted and stored in 4th Dimension database fields. Both 4D Calc and 4D Write let you save documents as Mac files or as picture fields within the database.

4D Calc is by no means as rich as Excel, but it provides a good selection of the most frequently used spreadsheet tools. Excel users will miss a macro recorder, and 4D Calc's presentation tools leave something to be desired.

You'll also encounter some hurdles if you want to import files from other spreadsheet programs with 4D Calc. You can open a SYLK file with the program, but formulas may be lost in the conversion, leaving only values. If you remove the equal sign (=) from the formulas in Excel before saving them, you stand a better chance of recreating your model intact with 4D Calc. Similar problems occur when you open a SYLK 2.0 4D Calc document from within Excel.

ACIUS supplies good documentation with 4D Write and 4D Calc, but even more helpful are the sample databases supplied on-disk. They demonstrate how the modules are used in conjunction with 4th Dimension and suggest the design potential for more-sophisticated applications.

4D XREF

4D XREF helps developers keep tabs on their ever-expanding designs. If you've ever wondered how many of your scripts make use of the variable **gDone**, 4D XREF can tell you.

4D XREF analyses your database and provides lists of its procedures, variables, commands, externals, structure elements, and layouts. Each cross-reference group is displayed in a window that consists of two panes with a movable divider line and scroll bars.

If you click on an item in the left side of the window, the right side displays a list of all the locations where that command is used in your database. You can also save the entire XREF file as a text file and use it with other applications.

One useful but confusing feature of XREF is that it lets you shift-click to mark or unmark a group of objects in an XREF window. This approach makes it easy to accidentally uncheck items that you really want checked. A traditional marquee tool would work better.

A Layouts listing makes it easy to view layout procedures as well as the layouts themselves. Separate printing options for the two views let you decide how much hard copy you want to pull out.

The Structure listing is particularly useful, because it maps out all the relations in your database in the format `[File1]FieldA-->[File2]FieldB`. This flattening of the structure map can clarify large and complicated structures.

The Bottom Line

4D XREF is a tool that no 4th Dimension-database developer will want to be without, but the real development opportunity lies with 4D Write and 4D Calc. With these new 4th Dimension add-ins, ACIUS has created a new class of integrated software for database developers. By eliminating the need to export and import data for tasks such as mail-merge and numerical analysis, 4D Write and 4D Calc enable new applications. The challenge and the reward lie not in simply dropping the modules untamed into layouts or external windows but in devising new ways to apply them.

— Louis E. Benjamin, Jr.

Get Info

4D Calc ★★★½
4D Write ★★★½
4D XREF ★★★★½
Published by: ACIUS, 10351 Bubb Road, Cupertino, CA 95014; (408) 252-4444.
Version: 1.0.
List Price: 4D Calc, $295; 4D Write, $295; 4D XREF, $200.

Our Latest PostScript Printer Technology Impressed The Experts...



MacUser, Editor's Choice Award (Eddy), Jan. 9, 1991

PC/Computing, Most Valuable Product, Nov. 1990

BYTE, Editor's Product Merit Award, Jan. 1991

Personal Publishing, 1990 Outstanding Achievement Award

QMS-PS 410, 815 & 825 PostScript Laser Printers

- ESP - Emulation Sensing Processor (printer interprets incoming printer language and switches automatically)
- SIO-Simultaneous Interface Operation (allows the printer to receive data from three interfaces simultaneously)
- LocalTalk, RS-232C serial and Centronics parallel interfaces (connects to IBM® PC's, Apple® Macintosh® computers and most mini computers and mainframes)
- 45 resident Adobe PostScript typefaces (all can be scaled from 4 points upward, rotatable, all with multilingual character sets)
- Front Panel Display on QMS-PS 815 & 825 (16-digit multilingual LCD array conveys printer status, allows user to quickly configure printer)
- Resident HP LaserJet Series IIP & PostScript emulations (prints PostScript & HP applications, HP-GL emulation cards available)
- QMS ASAP III Technology and 68020 Microprocessor (exclusive technology means fast first-page-out performance)
- PS Executive Series™ Utilities Software (to easily set printer parameters)

...So We Decided To Give Them More Of A Good Thing.

Before we developed the QMS-PS® 410 four page-per-minute laser printer, we performed one very important task. We listened to what you wanted. Then we engineered a printer light years ahead of the rest with features that aren't available on other printers at any price.

And now, QMS brings you more of a good thing. The QMS-PS 815 and 825. Two eight page-per-minute laser printers with all the leading edge features of the 410 *plus* enhanced processing speed, an increased duty cycle and an easy-to-read, multilingual front panel that lets you quickly configure the printer to suit your specific needs.

Award-Winning Simplicity

How did these printers capture the imagination of an entire industry? The answer is, quite literally, simple! These leading edge printers are so simple to operate they seem to "think for you." Each printer features ESP* (Emulation Sensing Processor) which allows them to interpret incoming data and automatically choose the appropriate printer language without changing switch settings or sending complicated software commands. And to make things still simpler, the 410, 815 and 825 can receive data simultaneously to LocalTalk®, RS-232C serial and Centronics® parallel interfaces, which makes them the best on the market for mixed computer environments. All this and more is the result of QMS's exclusive ASAP™ III technology (Third Generation Advanced System Architecture for PostScript). And it's this proprietary QMS® technology that wins awards *and* customers.

True Adobe PostScript Plus HP Emulations

Whether you choose the 410, 815 or 825, you'll enjoy the desktop design flexibility of the latest version of Adobe® PostScript®. This most recent version includes the output enhancement of Adobe Type Manager™ (ATM). All printers come standard with 45 resident typefaces scalable from 4 points upward and fully rotatable. These PostScript printers guarantee compatibility with thousands of useful PostScript applications currently on the market.

For even greater flexibility, these printers feature standard HP® LaserJet® Series II emulation to support non-PostScript printing applications. And a variety of options makes the printers easily expandable. HP-GL® emulation cards, HP compatible font cards, memory upgrades and extended paper handling capabilities are all currently available.

Expert Service And Support

As a recognized leader in PostScript printer technology, QMS maintains a commitment to customer satisfaction by providing free, responsive technical support. And to keep your QMS printer operating at its peak, QMS National Service offers a variety of service options. Call us today and see how QMS quite simply makes the best PostScript laser printers in the world. Or FAX QMS Product Information at **(205) 633-4866.**

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*patent pending

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HYPERMEDIA

ConvertIt!

Bring HyperCard stacks to the PC with ConvertIt!.

ConvertIt! unlocks the door to the PC market for HyperCard developers. It does an excellent job of converting HyperCard stacks to ToolBook, a Windows 3.0 hypermedia product for the PC from Asymetrix.

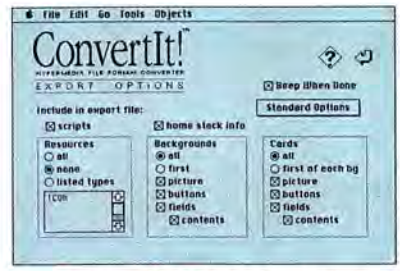
ConvertIt! consists of two programs — Mac software for exporting stacks and PC software for importing stacks to ToolBook.

As a Windows hypermedia program, the $395 ToolBook requires a hefty investment in PC hardware and memory, preferably a 386-based system with 4 megabytes of memory. You also need a method for sending HyperCard files from the Mac to the PC. Writing to a PC-formatted 3.5-inch disk using Apple File Exchange (AFE), is the easiest way, but you can also send files via a direct-connect cable between the two machines or over a heterogenous network. Another alternative is to upload them from the Mac to a bulletin-board or information service and then download them to the PC. Because ConvertIt! saves HyperCard files as plain text, any method that moves files from a Mac to a PC will do.

An important thing to keep in mind is that ConvertIt! doesn't completely map a stack into ToolBook format. The software serves primarily as an aid to the conversion process. Although it accomplishes a lot, converted stacks will always need some cleaning up. ConvertIt! can handle HyperCard stacks through HyperCard version 1.2.5, but its current version can't read HyperCard 2.0's new file format.

Icon-Ignorant

ConvertIt! converts all HyperCard objects to ToolBook objects. HyperCard and ToolBook treat graphics differently, however, and ToolBook doesn't understand icons. Consequently, icons and bit maps can create problems: Bit maps are converted into graphic objects in ToolBook, where they have the annoying habit of trapping mouse clicks that were intended for background buttons or fields. Icons are converted into graphic objects, which are not associated with buttons, as icons are. Both icons and graphics are likely to take up considerably more disk space when converted to ToolBook, because ToolBook lacks HyperCard's sophisticated compacting format.



ConvertIt! provides tools for deselecting field contents, scripts, and resources before a HyperCard stack is converted to ToolBook. The result is a template in ToolBook with the look and feel of the original HyperCard stack.

Properties of HyperCard objects that have no ToolBook equivalent are not converted. For example, HyperCard fields have both a field number and a field ID, but ToolBook fields use only the field ID. Resources, such as fonts and sounds, don't get converted. You have to reconstruct them in the Windows environment, though you can specify that ConvertIt! should substitute a "best match" for fonts.

Lost in the Translation

Most significantly, ConvertIt! doesn't fully convert HyperTalk scripts to ToolBook's scripting language, OpenScript. You can choose to have ConvertIt! convert as much of a HyperTalk script as it can handle into OpenScript — but be prepared for a long coffee break while the program cranks away. You can also opt to leave scripts out entirely and program them in ToolBook's OpenScript from scratch. Or you can use ConvertIt! to convert HyperTalk scripts to ToolBook, where they serve as helpful references when you get ready to replace them with OpenScript equivalents.

ConvertIt! also includes an on-line HyperTalk-to-OpenScript dictionary, which is a helpful guide for converting your own scripts. Another valuable feature is ConvertIt!'s conversion report, which details any known errors in converting scripts as an aid to debugging.

ConvertIt! doesn't convert external commands and functions to ToolBook. This is potentially more serious than the lack of certain HyperTalk commands in OpenScript or the lack of certain object properties. You can usually work around the latter, but externals are typically used to increase the speed of some critical processes. There is not likely to be a way to convert the performance of externals, short of writing their equivalent in the ToolBook world.

The difficulty with externals creates two classes of HyperCard stacks in terms of convertability. Some stacks will convert relatively smoothly, requiring at most some thoughtful OpenScript scripting and tweaking of objects. Others, because they depend on external commands or functions, require a serious programming effort in C or some nonscripting language. These stacks justify conversion only if they're essential or there's a real market for them.

Effectively using ConvertIt! requires some practice. Only experience will indicate which stacks take up too much disk space or are unappealing when converted. To help in the selection process, ConvertIt! lets you select an entire folder of stacks for conversion and then check off those stacks you don't want included. You'll find ToolBook nearly as powerful and flexible as HyperCard, so almost anything you decide not to port can successfully be re-created in ToolBook.

ConvertIt! works its magic with a stack-specification format called HIFF. Stacks are written in HIFF format at the HyperCard end and then read at the ToolBook end. The Hypermedia Group, which developed ConvertIt!, has published the HIFF specs so that anyone can create products for converting other hypermedia tools. For example, you can create tools for converting SuperCard stacks to HyperCard or ToolBook to Plus.

The Bottom Line

Although ConvertIt! may not handle the whole job of converting HyperCard stacks to ToolBook format, it's still an indispensable tool for HyperCard developers who are looking for a smooth conversion path to the PC market.

— Michael Swaine

Get Info

ConvertIt!

$$$$

Published by: Heizer Software, P.O. Box 232019, Pleasant Hill, CA 94523; (415) 943-7667.
Version: 1.2.
List Price: $199.

The 11" x 17" PostScript Powerhouse Just $9995!



Features That Make The QMS-PS 2210 A True PostScript Powerhouse!

- Up to 11"x17" printing capability
- 22 pages per minute and QMS ASAP technology cuts waiting time
- 4 MB RAM builds complex pages quickly
- 39 resident Adobe PostScript typefaces
- HP LaserJet & HP-GL emulations for non-PostScript applications
- AppleTalk, RS-232 serial and Centronics parallel interfaces mean instant connectivity in practically all environments
- Choice of 350 or 600 sheet input capacity
- SCSI port allows connection of up to seven external hard drives for font caching and permanent storage of downloadable typefaces, emulations and PostScript programs
- PS Executive Series™ utility software allows each user to name, configure and align the printer as well as download fonts from the individual host computer

22 Pages Per Minute Give It The Best Price-To-Performance Ratio On The Market

It took QMS® to engineer a 22 page-per-minute PostScript® laser printer that stretches beyond the capabilities of other printers and *still costs less!* The QMS-PS® 2210 reaches beyond many others by giving you all popular paper sizes up to 11" x 17"/A3-size printing capability. And it surpasses others in print quality as well with laser-sharp fine line detail and rich saturated black fill areas. No more pale cut-and-paste newsletters, no more mismatched spread sheets, no more engineering and design projects held together with staples and tape! And the 2210 beats the competition price-wise, too, by delivering all this and more for just $9995.

Perfect For The "Upscale" Network

The QMS-PS 2210 is perfect for a shared printer environment requiring high-quality 11"x17" output. Whether you use Macintosh® computers, IBM®PC's /compatibles or most other mini computers and mainframes, you'll enjoy instant connectivity with AppleTalk®, RS-232 serial and Centronics® parallel interfaces. Should you require non-PostScript printing applications, the 2210 comes standard



with HP-GL® and HP® LaserJet® emulations. The 2210 also cuts waiting time with fast page processing made possible by QMS's exclusive ASAP™ (Advanced System Architecture for PostScript) technology and a 68020 microprocessor. That means fast first-page-out performance. Add this to 350 sheet input capacity (600 sheets in the QMS-PS 2220) plus a 20,000 page-per-month duty cycle, and it's easy to see why the QMS-PS 2210 is a true network star!

Expert Service And Support

As a recognized leader in PostScript printer technology, QMS maintains a commitment to customer satisfaction by providing free, responsive technical support. And to keep your QMS printer operating at its peak, QMS National Service offers a variety of service options. Call us today and see how easy it is to put the true PostScript powerhouse to work for you. Or FAX QMS Product Information at **(205) 633-4866.**

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HYPERMEDIA

Reports 2.0

Reports 2.0 beefs up HyperCard database reporting.



Reports 2.0 creates sophisticated database reports for HyperCard users with a layout editor that works much like any DTP or forms program.

Reports 2.0 fills the gap left by HyperCard's limited report-generation ability by delivering powerful database-reporting capabilities to HyperCard 2.0 users. You can create your own report layouts, choose any HyperCard-based record-selection and sorting criteria, and print the results. You can also create fliers and catalogs complete with graphics, set up mail-merge form letters, and devise a host of other documents based on HyperCard data.

The new version corrects the problems users encountered with the original Reports by integrating the program's layout editor with HyperCard 2.0 (the original version required you to use the tool as a separate application) and by eliminating the Report Card, an additional card you had to add to a stack before you could use Reports. New features in version 2.0 include color text and graphics, custom ImageWriter page sizes, more-powerful alignment tools, date- and currency-formatting options, more script handlers, and support for printing across multiple backgrounds in the same stack.

Reports 2.0 gives you a Reports button in your HyperCard stack. Clicking on the button brings up a palette with which you create, edit, and print your reports; scroll through cards of a particular report's record-selection list; and access the on-line help.

The Reports layout editor is an application, but it can be launched only from within HyperCard. An icon bar under the title bar contains the selection, line, box, rounded-box, text, field, and graphics tools. The basic layout tools work just like those in any graphics or DTP program.

Once you've created your layout, you merge HyperCard data and graphics with your document by using either the field tool or the graphics tool to set the boundaries that locate and enclose the data. To integrate data and text in a form letter, you create a series of globals that define the fields you need. You then type your text into a Reports document, specifying the global with a caret (^) — for example: "I'm sorry to say that your balance of **^Balance** is **^Outstanding** days past due."

For defining globals and other operations, each report can have a HyperCard-like script. Because scripting plays a major role in Reports 2.0, it's no beginner's tool, but anyone who has created a stack should be able to handle the program.

Lay It Out

Layouts can be divided into several sections: header, footer, detail (main body), break (for subtotals, averages, and so on), and total. While you're in the layout editor, you determine the selection or sorting criteria. You can assign up to 5 sort levels (ascending and descending) and 32 selection parameters per report.

When your documents are complete, you print them by going back to the original stack, calling up the Reports palette, and clicking on the Print icon. This brings up a standard Print dialog box, which lets you print your report with information from the current card and its selection criteria or previously selected criteria. You can preview the report before you print it.

If you've already created documents with previous versions of Reports, you'll be happy to know that version 2.0 converts them to work with it. However, we discovered that the conversion process doesn't always bring over all the previous selection criteria. An easy way around this problem is to open the old report, issue a Select All command, open a new report, paste, and reset the selection and sort criteria.

One other sore point is Report 2.0's documentation. Although the on-line help is useful, the manual is incomplete, especially when it comes to scripting information. Fortunately, Report 2.0's maker, Nine To Five, offers excellent technical support. You can reach the company on CompuServe or directly by phone.

MasterView Too

A welcome bonus with Reports 2.0 is Nine To Five's MasterView, bundled with the program at no extra cost. By itself, it may be worth the $149.95 price of the package. You access MasterView through the Reports palette, and it presents your entire stack in a spreadsheet view, making it a breeze to make changes. The Reports package also includes a copy of the Claris version of HyperCard 2.0 (2.0v2).

The Bottom Line

Reports 2.0 is actually several applications in a single package: It's a layout editor and card selector, and with the addition of MasterView, it's also a viewing and editing system. If you're a HyperCard 2.0 user looking for a way to get at your HyperCard data, make changes to it, and output it in report form, Reports 2.0 is for you.

— Tom Petaccia

Get Info

Reports 2.0

$$$$½

Published by: Nine To Five Software, 3360 Mitchell Lane, Suite 105, Boulder, CO 90301; (303) 443-4104.

Version: 2.0.

List Price: $149.95; upgrade, $60.

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12106B

PROJECT MANAGEMENT

Project-Scheduling Tools

FastTrack Schedule and MacSchedule create good-looking project reports.

Although they're not designed to be full-blown project-management packages, FastTrack Schedule and MacSchedule both specialize in making Gantt charts better looking and more effective at presenting project-scheduling information. Of the two, FastTrack Schedule does the best job of presenting the most information in the best-looking format, although it lacks MacSchedule's spreadsheet and graphing tools. A third package, MacSchedule Plus, is a good choice for presenting project costs in addition to schedules.

Gantt charts are time lines that show all scheduled project tasks, including start and stop dates for each task. They're indispensable tools for presenting a project's progress to management.

There's no question that using FastTrack Schedule or MacSchedule is a better alternative than drawing Gantt charts by hand. But the real test of a project-management document is how much information it conveys. FastTrack Schedule documents are noteworthy for the sheer amount of schedule detail they can contain while still looking good.

Custom Layout

FastTrack Schedule supports multiple custom columns, which makes it easy to enter as many project details as you need. MacSchedule, on the other hand, supports only one custom column.

After you've created columns in FastTrack Schedule, the program gives you maximum control over their appearance. Special columns capture start and stop dates from existing time lines, and entering dates into these columns creates a corresponding time line. Although you can paste graphics into FastTrack and MacSchedule, FastTrack lets you align them more precisely on the chart.

FastTrack Schedule gives you better-looking documents, but MacSchedule wins points for its spreadsheet and graphing tools. You can convert any date grid into a spreadsheet to display project costs or manpower loading, and the data can then be graphed. Both programs can also import data for time lines from other spreadsheet programs or high-end project-management packages.

Because all project schedules are likely to change over time, both programs let you modify start and stop dates. Only MacSchedule gives you a facility for reporting slipped start and completion dates. The lack of this feature is FastTrack's only major flaw. Both programs let you divide your time line into weeks, days, months, and quarters. FastTrack extends the list to include years and fiscal years.

Although both products suffer from minor operational quirks, FastTrack delivers better response and more-precise manipulation of data. MacSchedule is hierarchical-menu-happy, relegating items that would be far more efficient in a toolbox or dialog box to a hierarchical menu. Changing the start and stop characters on a task time line, for example, requires several trips to the menu bar. FastTrack, on the other hand, uses too many dialog boxes. The Item Data dialog box, for example, contains only one item and would work much better as a menu choice.

MacSchedule Plus

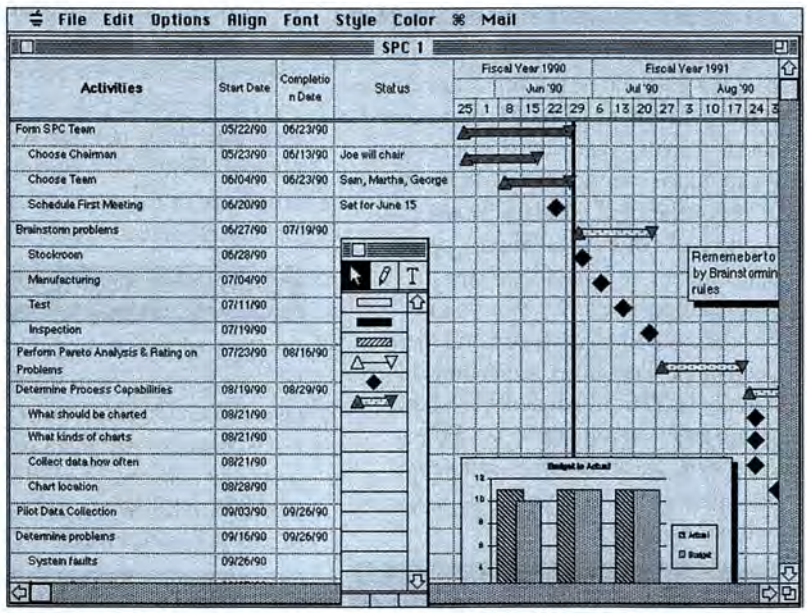
MacSchedule Plus has all of MacSchedule's features, with the addition of costing. Each task in a time line can have a cost, or earned value. When you set the earned value, the program generates a spreadsheet that produces an earned-value analysis, including actual-to-schedule variances for costs.

With MacSchedule Plus' powerful costing feature, you can prepare documents that display time lines, graphs of money spent over time, spreadsheets with cumulative cost amounts, and cost budgets for monthly cash outlays. You can also make charts that include earned-value analysis.

The Bottom Line

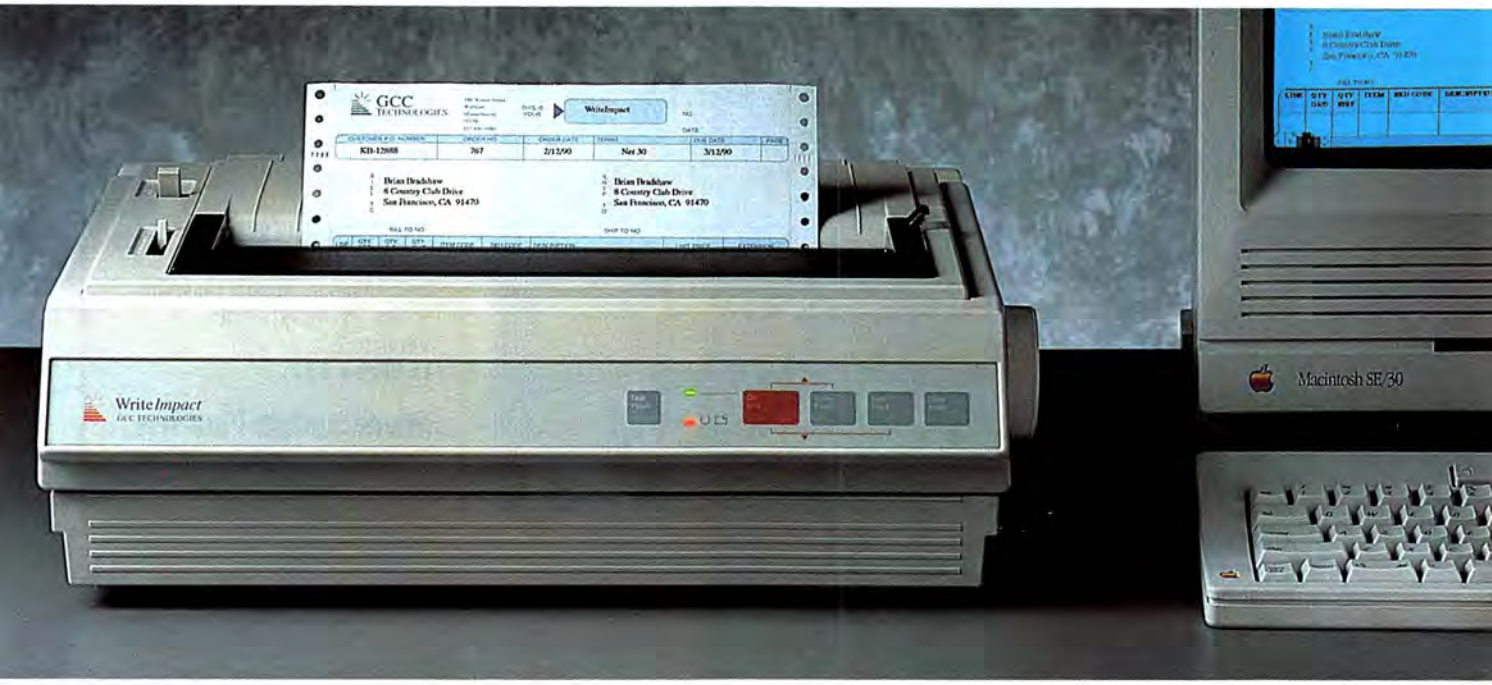
FastTrack Schedule and MacSchedule serve as solid project-communication tools. FastTrack excels at producing detailed, good-looking Gantt charts, but it lacks MacSchedule's spreadsheet and graphing tools and ability to report slipped start and completion dates. MacSchedule Plus is your best choice for calculated financial information and schedules.

— Daniel W. Rasmus



FastTrack Schedule's multiple columns and links of start and stop dates to a time line make it a good information manager and presentation tool. Although it does not support graphs, you can import charts from your favorite spreadsheet program.

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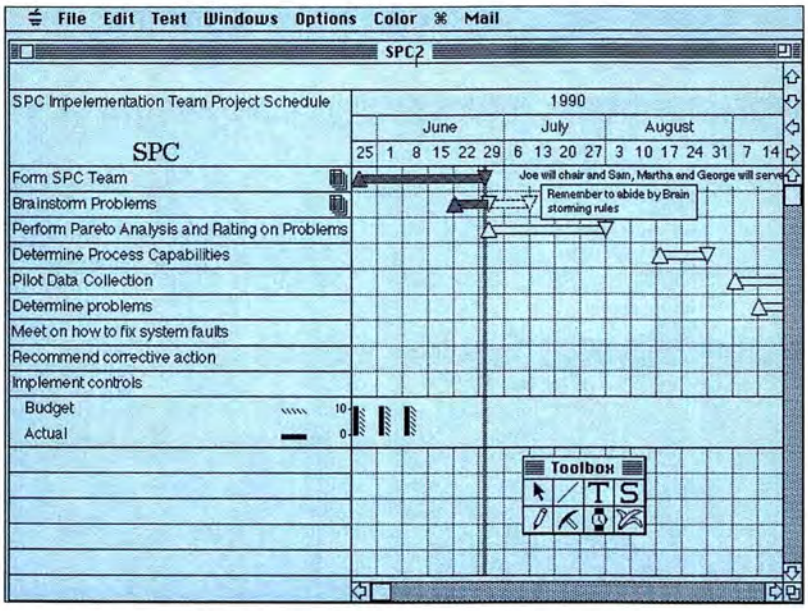
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12106G



MacSchedule documents lack pizzazz, but the program supplies spreadsheet and graphing tools. The program also supplies a facility for reporting slipped start and completion dates.

Get Info

FastTrack Schedule ★★★★

Published by: AEC, 22611 Markey Court, Building 113, Sterling, VA 22170; (703) 450-1980.
Version: 1.5.
List Price: $235.

MacSchedule ★★★½

Published by: Mainstay, 5311-B Derry Avenue, Agoura Hills, CA 91301; (818) 991-6540.
Version: 2.5.
List Price: $245.

MacSchedule Plus ★★★★

Published by: Mainstay, 5311-B Derry Avenue, Agoura Hills, CA 91301; (818) 991-6540.
Version: 1.0.
List Price: $345.

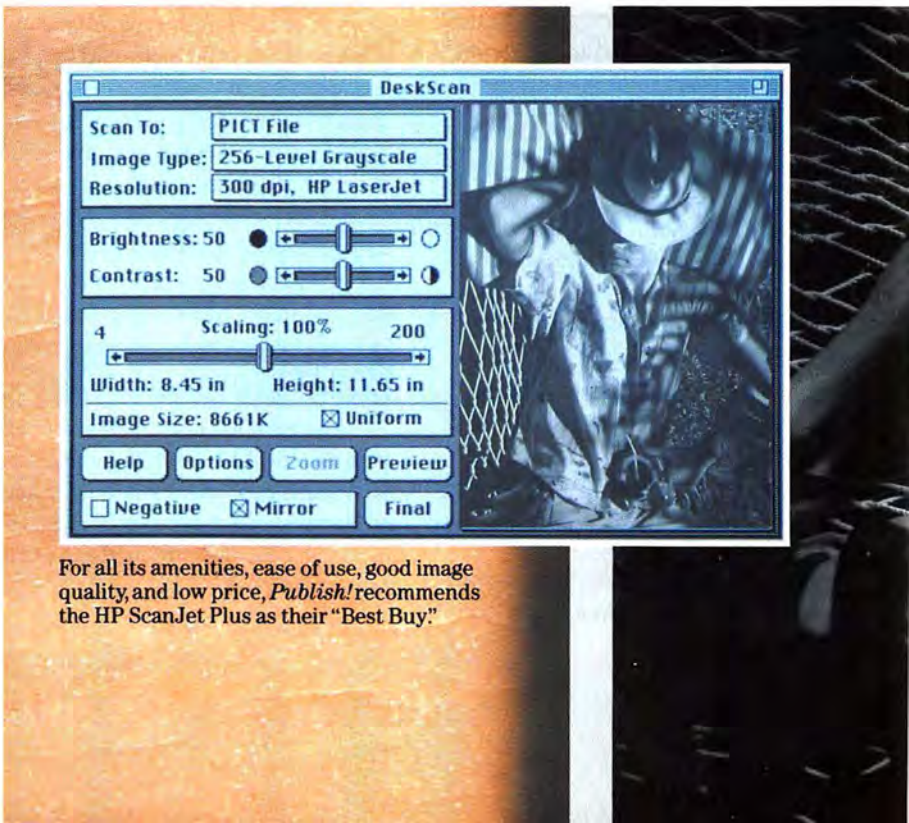
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Digital Darkroom

A well-fashioned upgrade boosts Digital Darkroom's image-processing power.

Gray-scale image processing with Digital Darkroom has just become more powerful with the release of version 2.0. The new package adds a wider variety of selection and painting tools, new colorization features, and a revamped interface that delivers easy access to the program's beefed-up functionality.

Although color image-processing packages such as Adobe Photoshop and ColorStudio have received a great deal of attention recently, not everyone needs the power of these more expensive packages. If you're on a tight budget and you don't own a color monitor, there's not much sense in spending an additional $500 or so on a color package when the new version of Digital Darkroom can handle your gray-scale images quite nicely.

To use the new version of Digital Darkroom, you need a hard drive, System 6.0.4 or later, and plenty of RAM (we recommend at least 4 megabytes). Digital Darkroom loads its images entirely into memory, so a 1-megabyte image requires, naturally enough, 1 megabyte of RAM. Additional RAM is needed for undo and transformation operations such as scale and skew.

Pop-Up, Tear-Off

New pop-up palettes provide easy access to Digital Darkroom's new tools and options while preserving the program's uncluttered interface. Silicon Beach has built plenty of flexibility into these palettes by letting you tear them off and move them around. You can minimize the screen space palettes occupy — but still keep them handy — by hiding everything but the title bar, using the window-shade control.

Previous versions allowed only 1 open file at a time; version 2.0 lets you have up to 20. This version includes five new selection and editing tools for enhancing images. Among the most impressive are a selection brush that lets you select part of an image simply by "painting" it and a new polyline tool that creates a selection one pixel wide. One of the program's palettes lets you control modes (New, Add, Refine, or Subtract) for the selection tool you're using. A new eyedropper tool picks up grays or primary colors from the foreground or the background of an image.

New painting tools abound in version 2.0. A brush tool lets you paint with selected portions of images. There's also

got it made in the shades.



*Suggested U.S. list price. ©1990 Hewlett-Packard Company PE12004

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The New Color Pivot Shown In Landscape And Full-Page Mode

The comparison you see above is really no comparison at all. ● If you live in a world where things are all middle with no top or bottom, or where the year has only six months, you might choose the Apple.® But if you would like to see a full page of color graphics, and see twelve months of spreadsheet instead of merely six, and be able to go from portrait to landscape with swift and deft ease, *and* own the only color full-page display on the





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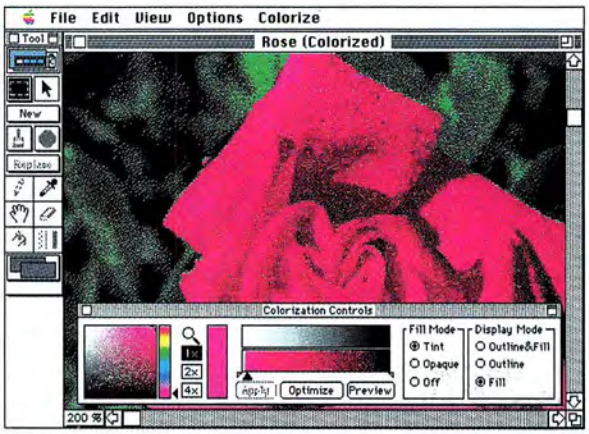
The Apple 13" Shown In Landscape And...Uh...Paperweight Mode.

market, you will probably choose the Color Pivot.™ Okay, you will definitely choose the Color Pivot. ● The Color Pivot is compatible with all color capable Macs. And on the Mac IIsi and IIci with built-in video, the Color Pivot needs no interface. But when all is said and done, perhaps the best thing about the Color Pivot is that, well, it's a Pivot. ● For more information, or the location of your nearest Radius reseller, call 1 (800) 227·2795.

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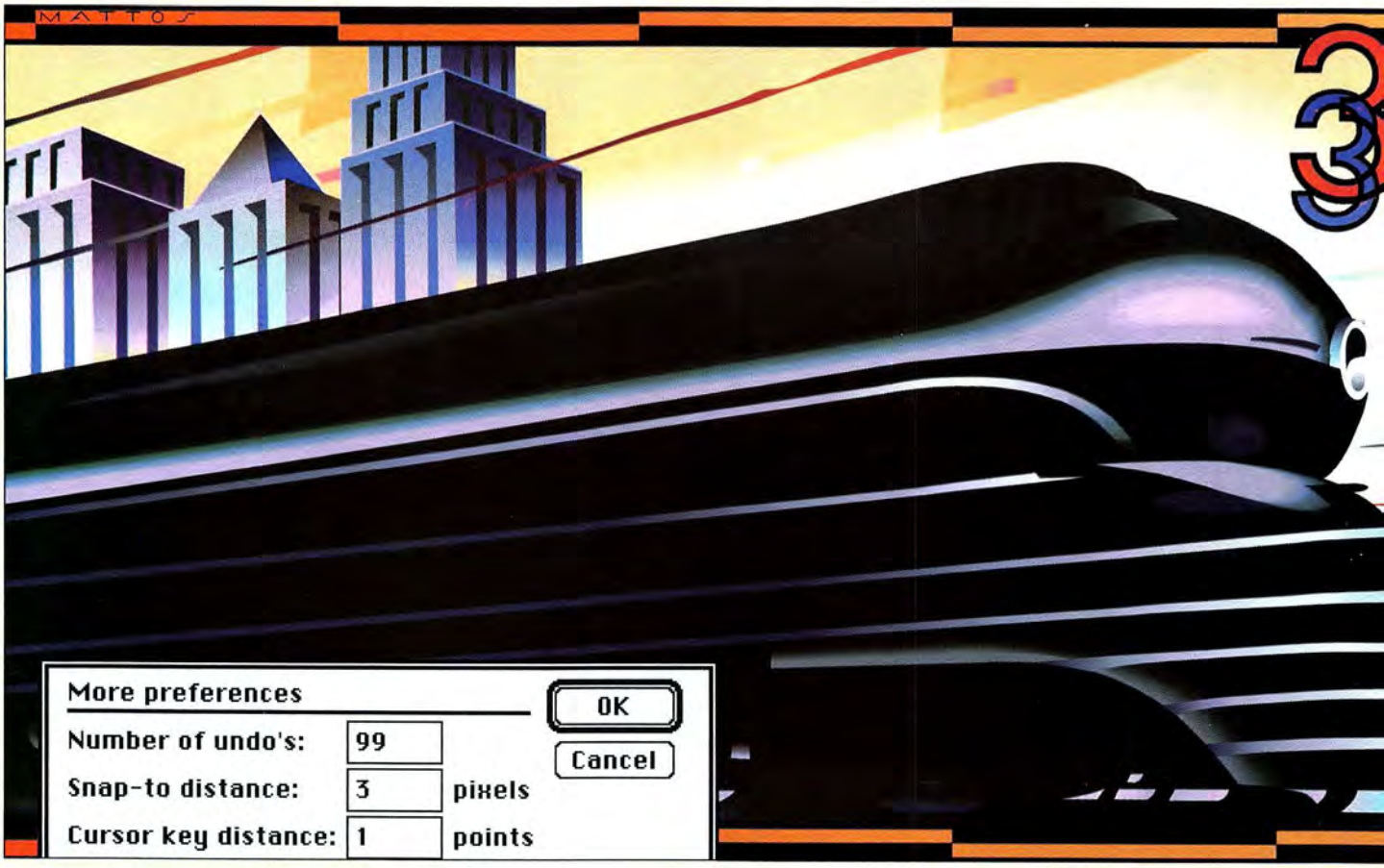
If you don't need the color-processing power of an Adobe Photoshop or a ColorStudio, the new version of Digital Darkroom is an excellent tool for enhancing gray-scale images.



Digital Darkroom 2.0's new Colorize option brings a ruddy blush to a gray-scale rose. The process is much like placing tinted acetate over a black-and-white photo.

a paint-bucket tool and a pop-up brush-shape palette with 32 default brush shapes. You can also create, edit, save, and load a library of custom shapes. New 8-bit brushes provide a large selection of gradient blends. Another pop-up palette gives you a selection of nine brush modes: Replace, Blend, Texture, Blur, Stamp, Lighten, Darken, Smudge, and Sharpen. Yet another brush-control palette features various slide controls and a handy scratch pad that lets you test your changes to current brushes before using them on the image itself.

Other noteworthy additions to Digital Darkroom are the text module, new layout tools, and colorization controls. The text module, which supports ATM and



TrueType, lets you create text strings and stamp them into images. The program's layout environment is substantially improved by the addition of rulers and cross hairs to the work area. And last, but *not* least, the program's colorization controls let you apply color washes to selected portions of an image, much as you place a piece of tinted acetate over a black-and-white photo. You select the desired tint with the program's proprietary color selector or through the Apple Color Picker. Digital Darkroom's colorization is no substitute for the power of a true color application such as Photoshop, but it provides a fun and easy way to enhance black-and-white images. (You need 32-bit QuickDraw 1.2 — which also improves overall performance — to take advantage of this feature. Some of the newer Macs — the IIci, IIfx, and the LC — have 32-bit QuickDraw built in to ROM. If you don't own one of these models, however, you can use the 32-bit QuickDraw INIT distributed with Apple System software.)

In order for other applications to recognize the color washes you apply to your images, though, you must export the images in TIFF format. This creates a bit of a problem if you want to edit the colorized image further in Digital Darkroom, because the program opens exported colorized TIFF files in gray-scale format. So you must also save the image in Digital Darkroom's native PICT2 color format.

Version 2.0 provides new calibration controls that let you compensate for any shortcomings and idiosyncrasies of your printer or scanner. You can save specific settings to disk and use them later with other images. Version 2.0 also has a new on-line help feature that explains the new tools and operations.

The Bottom Line

Silicon Beach has done an admirable job of expanding Digital Darkroom's features and versatility without sacrificing ease of use or tacking on a painful price hike (the price is still $395). The program is an excellent choice for users who don't need the power of more-expensive packages, such as Adobe Photoshop. Although you won't find the program setting any speed records, even on faster Macintoshes such as the IIcx, it's well behaved and reliable. If your image-processing needs are limited to gray scale, Digital Darkroom is an excellent choice.

— Gregory Wasson

Get Info

Digital Darkroom

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Published by: Silicon Beach Software, 9770 Carroll Center Road, Suite J, San Diego, CA 92126; (619) 695-6956.
Version: 2.0.
List Price: $395. Registered users of versions 1.0 or 1.1 can upgrade for $75.



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CalenDAr

★★★★

CalenDAr, the latest entry in the appointment- and reminder-software arena, combines ease of use with the most-innovative sound features you can find in a scheduling package. CalenDAr is not as full-featured or as flexible as competing packages such as CE Software's Alarming Events, however.

The *DA* in CalenDAr stands for *desk accessory*, which is what CalenDAr is. When you open the program, it displays a small calendar of the current month. What makes CalenDAr so convenient and easy to use is that every program function, including the help function, is available from this calendar display. You access the windows used for listing, entering, and editing appointments and reminders by clicking on the appropriate location on the calendar. If you prefer, you can also display CalenDAr's menu bar.

To schedule reminders on a calendar, you simply click on the desired date and enter the time and message into the corresponding window. The maximum message length is 200 characters. The program also provides optional settings that let you create advance notification of your reminders, which you can have CalenDAr repeat at regular intervals. CalenDAr's pop-up menus assist you in almost every step of the scheduling process.

A separate window displays a list of pending reminders. In addition to the complete list, you can also choose to view only those reminders for a selected day. When a reminder appears as scheduled, you can choose to replay it again later by selecting the Snooze Alarm function.

What sets CalenDAr apart from the other packages in its class is the program's sound enhancements. Unlike Alarming Events, which lets you use only one system sound per session as you're setting up your reminders, CalenDAr lets you use any number of different system sounds. Not only can you attach a different system sound to each message you create, but you can even record your own sounds directly from within CalenDAr, using Farallon's MacRecorder driver. That means you can record your own voice so your reminders can be spoken as well as written.

CalenDAr's only limitation is its lack of flexibility for some scheduling tasks. Most frustrating is that CalenDAr automatically deletes reminders once they've come due. Unlike Alarming Events, the program offers no option for saving or archiving reminder information for future use. Also, you can't adjust the duration of the snooze delay or change your sound selection when a reminder appears.

Despite these minor shortcomings, CalenDAr combines all the essential features of reminder software with a thoughtfully designed interface. Its unique sound support and ability to access every program function from a single calendar display set CalenDAr apart from the field.

Psyborn Systems, Inc., 116 Smith Street, #206, P.O. Box 431, Charleston, WV 25322; (800) 866-4260. Version 1.0. $49.95.

— Ted Landau



DisplayServer II-DPD

★★★½

Pssst! Hey buddy, want a big-screen monitor for your Mac — cheap? How about a second monitor without going into hock? No, you won't have to meet any shady characters in back alleys. All you need is a DisplayServer II video card from Lapis Technologies. The card lets you reclaim an old VGA monitor from a discarded PC or use an inexpensive multiscan monitor — even a television will do. But there's a catch — watch out for incompatibilities between the card and some popular software applications.

Lapis has versions of the DisplayServer for every Mac model and probably will have a color version by the time you read this. *MacUser* looked at Lapis' monochrome NuBus version of the II-DPD, which supports monitors with nine different resolutions, such as the 640-x-480-pixel VGA, the 640-x-872-pixel multiscan portrait, and even the 1,152-x-910-pixel Sun-workstation monitor. It can also run several Apple monitors, including the Portrait Display, the Two Page Display, and the standard 13-inch color monitor (which runs in monochrome with the II-DPD board). Another version, the II DPD-TV, works with 640 x 24 and 320 x 240 television monitors, but it doesn't run some of the two-page monitors the II-DPD handles.

You begin the installation process by adding an INIT to your System Folder. Then you have to configure an 18-pin jumper block and decide which of the board's two output ports to use — the DB 9 (TTL) or the mini DB15 (VGA). To connect to an Apple monitor, you need an adapter connector ($15) between the standard Apple monitor cable and the board's VGA port. You can use the II-DPD board with other video cards for a multiple-monitor setup. When configuring a system for a single II-DPD board, you must use a keyboard-command sequence to tell the board which monitor you're installing. The manual tells you to boot with the enclosed floppy, but on a Mac IIci, you need to run the configuration process from a hard disk.

The card's biggest troubles, however, stem from its incompatibilities with Word 4.0 and Excel 2.2, which result in intermittent system crashes. Lapis claims that Microsoft has made changes that remedy the problem in updated versions of both programs. To its credit, once it's up and running, the DisplayServer produces a crisp, jitter-free image.

The $549 DisplayServer won't save you much money if you use it with a small monitor. Even if you already have a VGA monitor, you can purchase an Apple monochrome card *and* monitor for $50 less than the cost of the II-DPD board. And the II-DPD is only $99 less than Apple's color Display Card 4•8. However, if your fancy is full- or two-page monitors, the II-DPD board used with non-Mac monitors can save you thousands.

Lapis Technologies, 1210 Marina Village Parkway, Suite #100, Alameda, CA 94501. $549.

— John Rizzo



SnapJot

★★★★½

There was a time when capturing the contents of a Mac screen meant crossing your fingers and pressing Command-Shift-3. Those days are over. One of the most versatile and easiest to use screen-capture utilities today is SnapJot 3.0.

SnapJot is a DA and INIT combined. The INIT lets you capture any or all parts of a screen, window, dialog box, or menu. The DA lets you send the captured image to the Clipboard, print it, or save it as a PICT or paint file. SnapJot also lets you deposit images in a floating window that acts just like any regular Mac window. Using the floating window, you can create desktop notes or compare information

from different screens.

SnapJot provides other nifty options as well. You can tell it to automatically convert captured color images to black-and-white. You can also open multiple image-capture windows and tell SnapJot to capture the entire group of images.

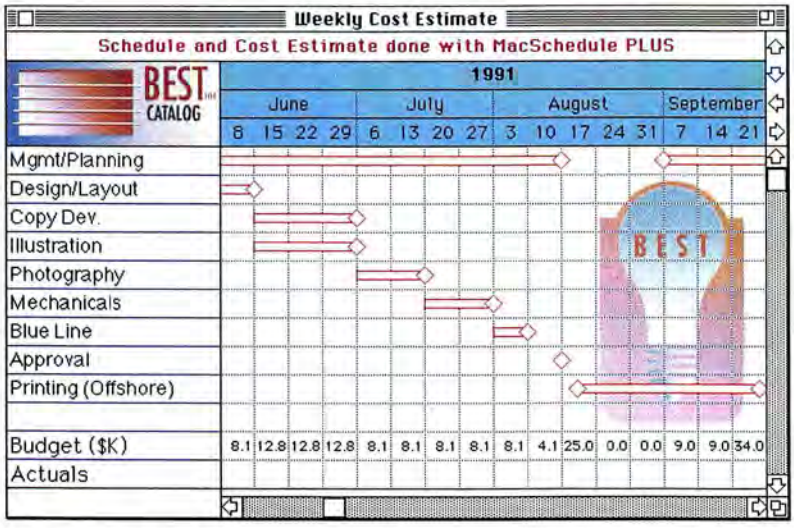
SnapJot eases the process of capturing images in several ways. Hot keys activate main program functions, such as Save to File and Print. SnapJot lets you preset the destination graphics application for each image you save, but you can choose to have the program prompt you for a destination. Likewise, you can set SnapJot to name a captured image automatically or to prompt you for a name after the image has been captured. All that's missing is a way to scale or crop captured images and to save them as startup screens.

SnapJot works flawlessly and is easy to learn and use. It's compatible with all Mac hardware and software, including large monitors. The well-intentioned manual is a bit dry and the English occasionally convoluted, but this minor issue aside, SnapJot is about as straightforward and intuitive as Mac software gets. If you need a guaranteed and foolproof way to get *anything* displayed on the screen into a document, SnapJot is for you.

Wildflower Software, 21W171 Coronet Road, Lombard, IL 60148; (708) 916-9350. Version 3.0. $59.95.

— Ken Gruberman

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For the Record

★★★★½

With For the Record, Nolo Press has taken on the ultimate organizing task — personal record keeping — and come up with a winner. The program takes the drudgery out of creating personal inventories by prompting you with an exhaustive list of questions for just about every category you can think of, from securities to credit-card slips, from medical information to valuable possessions.

For the Record's dedicated database includes 27 categories and more than 225 subcategories for tracking your personal information. The program's fields are user-configurable, so you can modify them if you don't find a category that suits your particular needs.

Using the program's math functions, you can assign a dollar value to any given category or to a list of categories. Then you can print it out as an itemized summary of your net personal or inventory worth.

For the Record comes with the standard Nolo Press manual — a trade-edition-style softcover book that contains instructions for the Mac and the IBM versions.

Overall, For the Record is the quickest, easiest way to create personal inventories with the Mac.

Nolo Press, 950 Parker Street, Berkeley, CA 94710; (415) 549-1976. Version 2.0. $59.95.

— Ken Gruberman



Studio Vision

4½

Studio Vision is a powerful and welcome addition to the array of Mac-based production tools for recording studios. It's the first software package to deliver seamless integration of MIDI data with digital audio recording. Studio Vision is actually an extension of Opcode's top-of-the-line MIDI sequencer, Vision. Vision has 99 tracks of MIDI data you can assign to 32 MIDI channels. Studio Vision lets you incorporate an additional 16 tracks of audio data assignable to 2 channels.

Studio Vision lets you record audio tracks along with MIDI data and then edit the two tracks separately or together. You can also import sound files from Digidesign's Sound Tools and Audiomedia and from Passport Designs' Alchemy. Once audio tracks have been recorded to disk, you can manipulate them in much the same way as you do MIDI events. They can be cut and spliced, moved around in time, duplicated, faded, or panned.

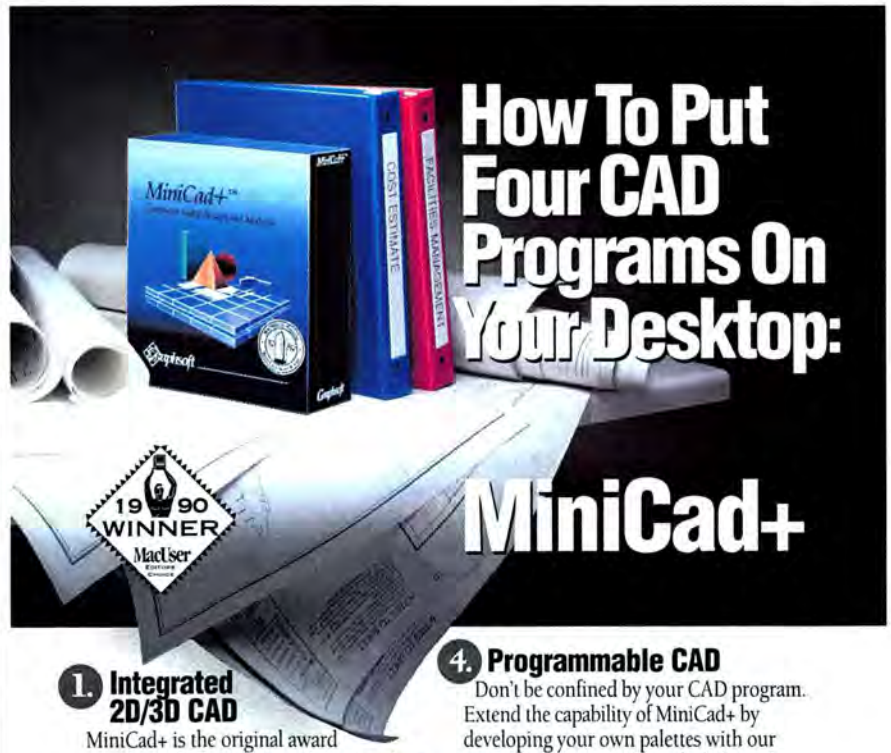
Unlike editing tape, these editing operations simply change pointers, so the data on-disk remains unaltered and any operation can be redone at any time. You can display event times in either musical terms (bars/beats/"units") or video terms (hours/minutes/frames), so the software is an excellent tool for editing film dialogue or sound effects. The program locks to SMPTE time code for use in a multitrack or video studio.

If you want to change the audio data, you can use Digidesign's Sound Designer II to filter, time-compress, change the pitch, mix tracks, and fix pops and glitches. Studio Vision makes this easy by providing "hot links" to Sound Designer II. Just select an area of audio to edit in Studio Vision and press Option-2, and you launch Sound Designer with your audio selection preloaded. Once you've finished making changes to the selection, you can return to Studio Vision with your edited audio already in place. You need Sound Tools to take advantage of this feature, but Digidesign says a version of the far-less-expensive Audiomedia system that links to Studio Vision is forthcoming.

Studio Vision's Strip Silence feature lets you remove from a track sections of audio that drop below a certain level. Later, you can eliminate them from the file to free disk space. This feature also chops the file up into discrete events you can move individually. The events can even be quantized, just like MIDI events, so that they all start on even beats.

You can play only 2 audio tracks at a time, but you can have up to 16 on-line, each displayed in a different color. This lets you record multiple takes of a track and then select individual measures or notes from each take and combine them into one flawless track.

Studio Vision is disk hungry. It eats up 5 megabytes per minute, per track. It is



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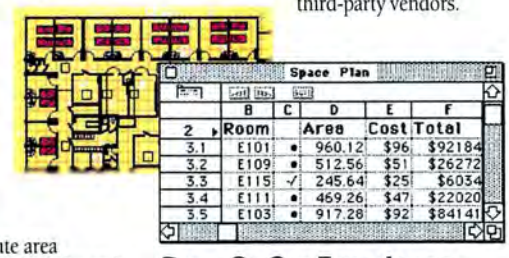
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also extremely finicky about disk and processor speed. It won't run on anything slower than a IIci if MIDI Manager is also running (Opcode says it is working on this problem). You'll also need a hard drive with at least a 28-millisecond access time.

For MIDI musicians looking for an alternative to editing with tape, Studio Vision incorporates digital audio as easily as it does MIDI data. For audio editors and sound designers, Studio Vision provides a wonderful new way of working. It's a real achievement.

Opcode Systems, 3641 Haven Drive, Suite A, Menlo Park, CA 94025; (415) 369-8131. Version 1.21. $995.

— Paul D. Lehrman



Oids

If you like arcade games, you'll love Oids. Oids combines futuristic action with adrenaline-pumping challenges. Oids is a unique mixture of two classic arcade games, Lunar Lander and Choplifter. The goal is to rescue the enslaved Oids, a race of tiny creatures, from hostile space terrains that bristle with antiaircraft artillery, guided missiles, and other weapons.

As in Lunar Lander, you have an overview of your ship and its surroundings as you move through space. You use the keyboard or a joystick to maneuver the ship and to avoid crashing into planet surfaces where the Oids are hidden. As you maneuver, you have to take gravity, acceleration, and velocity into account. The keyboard controls are confusing at first, but they soon become second nature. If you dislike the default controls, you can customize the configuration.

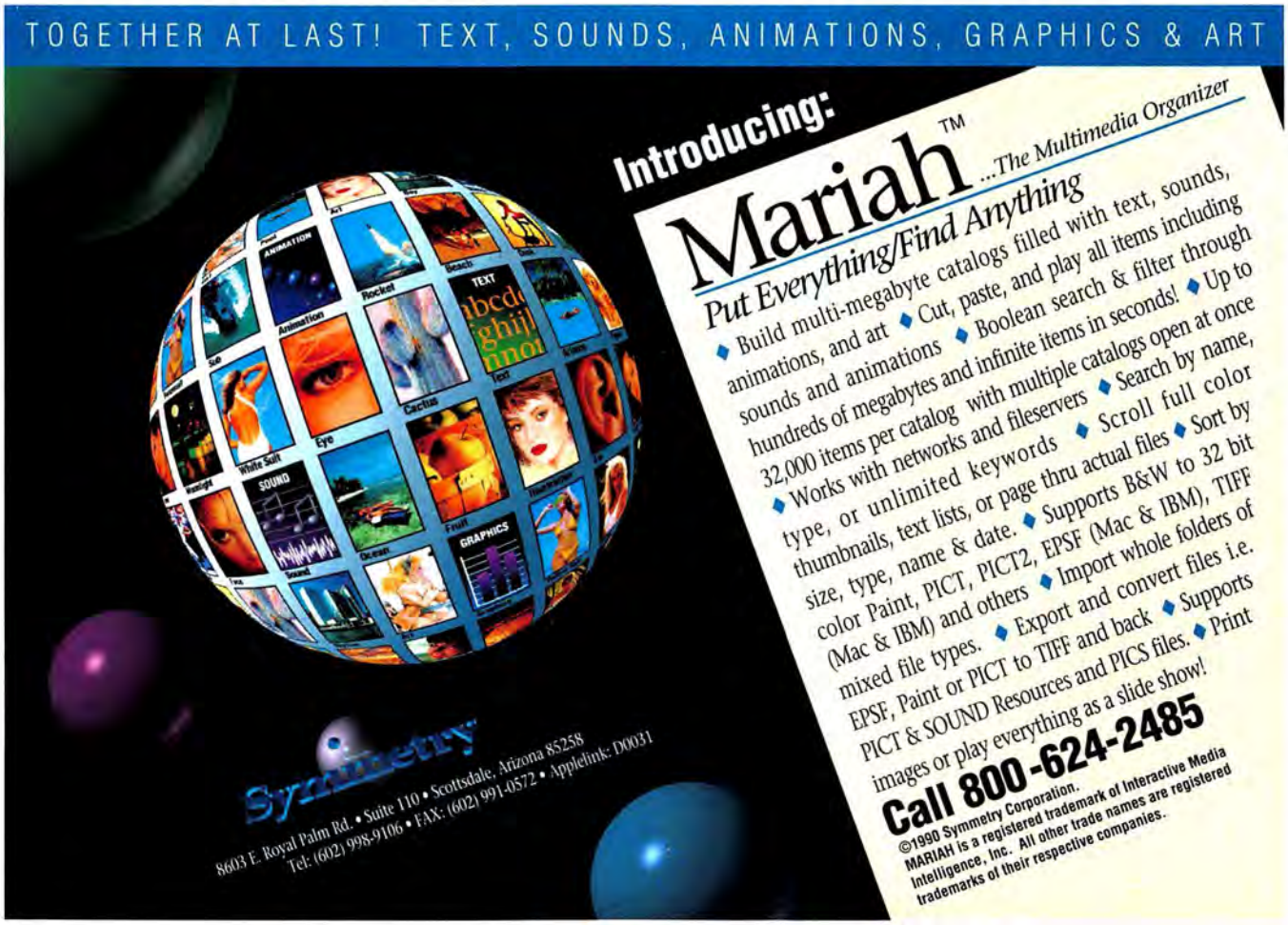
Once you're airborne, your ship flies over craggy landscapes covered with fortified enemy positions. Your foes attempt to down your spacecraft by hurling lethal projectiles. Your ship's shields can absorb a limited amount of this punishment while you respond to the attackers with rapid-fire photon guns and devastating bombs.

You rescue Oids by blasting open factories nestled among the enemy outposts. The action here resembles that of Choplifter. Once freed, the Oids run amok on the planet surface, waiting to climb aboard your ship when it lands. After you've touched down to pick up a full complement of eight passengers, you must return to the mothership to deposit the Oids and refuel your craft. After you've saved all the Oids, it's on to the next planet. A game takes less than 30 minutes to complete, but there's no time limit. Your mission is accomplished once you've cleared all the planets in a chosen galaxy.

Oids is one of the finest Mac arcade games ever. Although limited to 2 or 16 colors (depending on your Mac), the graphics are detailed and the animation superb. The package supplies 32 planets, but you can also design your own, using the built-in game editor. This game has lasting entertainment value.

FTL Games, 6160 Lusk Blvd., Suite C206, San Diego, CA 92121; (619) 453-5711. Version 1.0. $44.95.

— Owen W. Linzmayer



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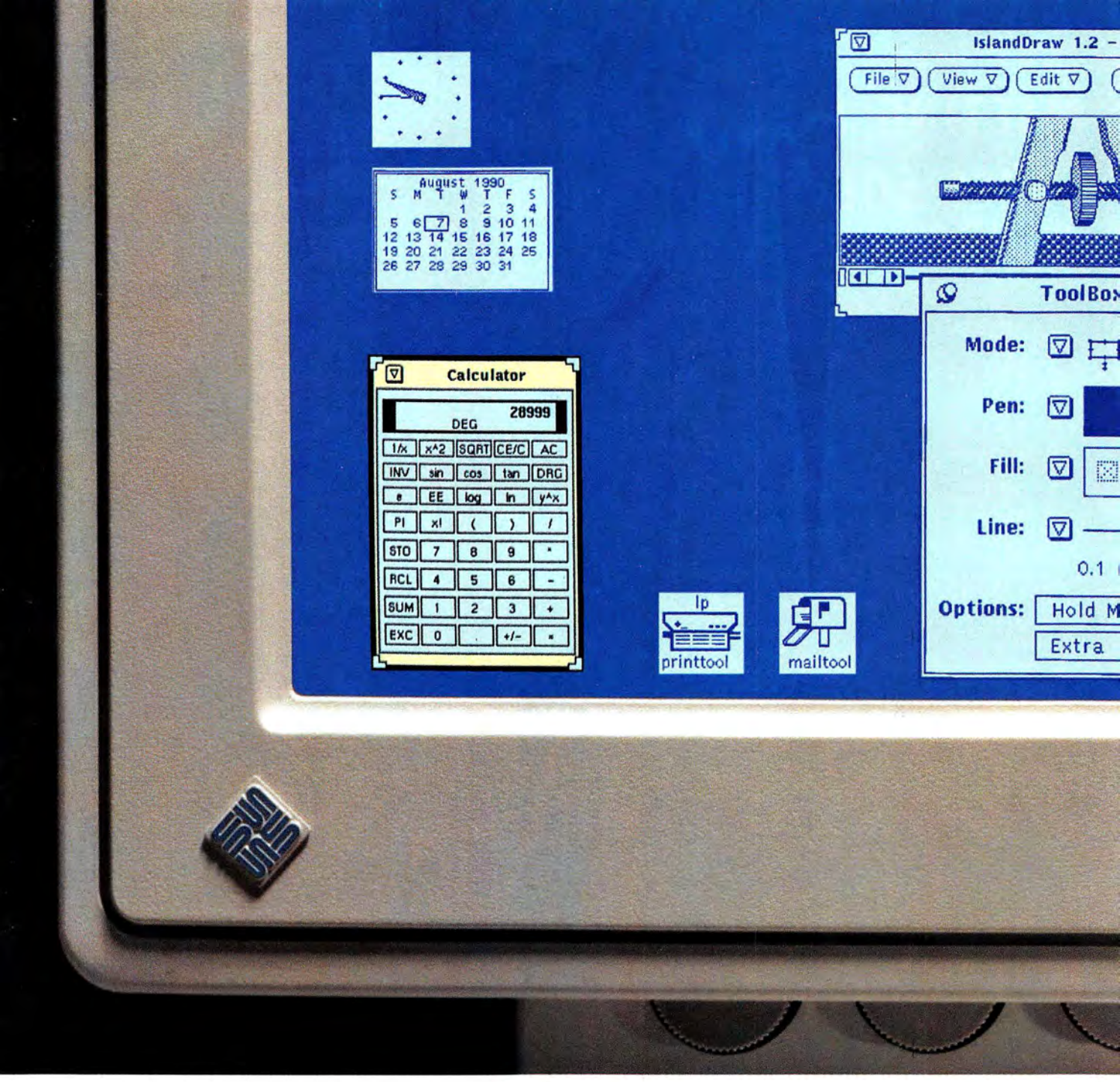
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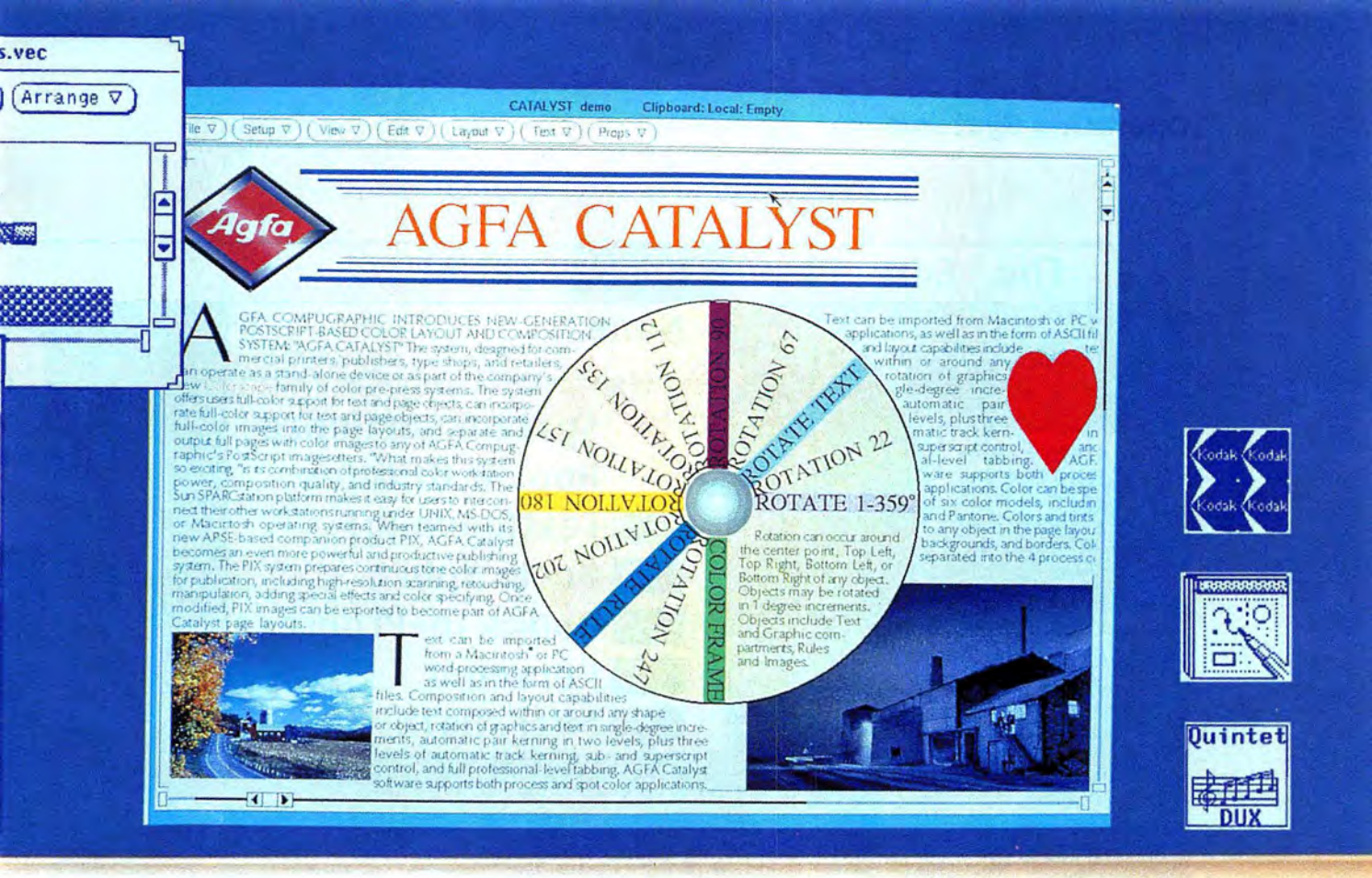
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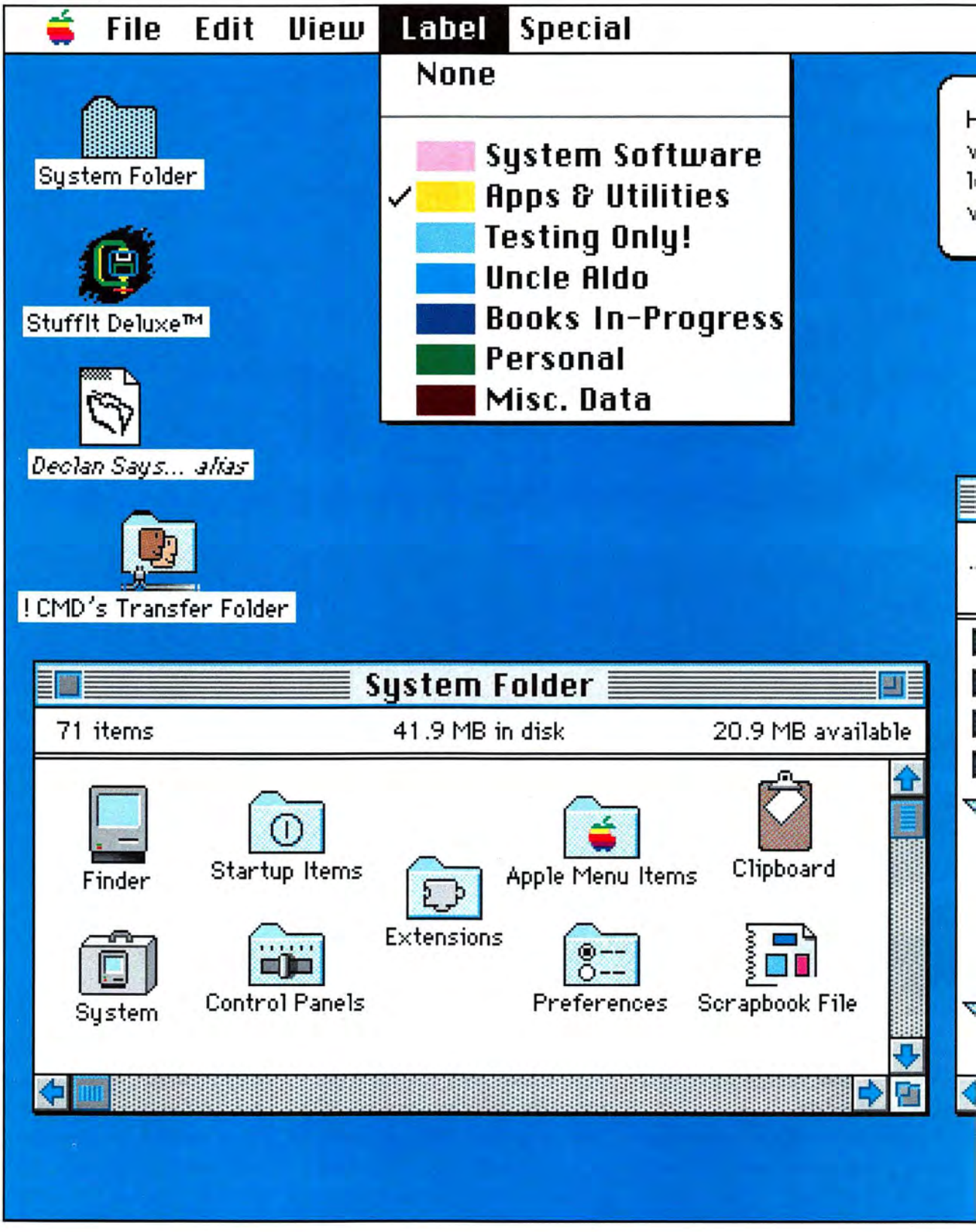
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System Folder
71 items
41.9 MB in disk
20.9 MB available
Finder
Startup Items
Extensions
Apple Menu Items
Clipboard
System
Control Panels
Preferences
Scrapbook File



70 THINGS YOU NEED TO KNOW ABOUT System 7.0

The long-awaited release of System 7.0 is just around the corner — here's everything you need to know about the most important upgrade ever.

It's been almost two years since the Mac community first heard about System 7.0. Heralded as Apple's most radical update to the Mac's System software, System 7.0 has been on a public-relations roller coaster, exciting us with promised new features and then disappointing us with delay after delay. Our impatience took on a fresh urgency with the release of Windows 3.0, the so-called Mac killer.

At long last, the wait is over — well, almost. At press time, Apple still hadn't announced a delivery date, but System 7.0 was in the late stages of beta testing and several of us at *MacUser* had been using it for some time. Our assessment: System 7.0 delivers on all (or most) of its promises.

BY CRAIG DANULOFF AND AILEEN ABERNATHY

System 7.0's benefits will be available to anyone with a Mac, 2 megabytes of memory, and a hard-disk drive. One-megabyte machines such as the Classic will continue to ship with the most recent version of System 6. Apple says that Mac users who install System 7.0 "will have practically a new machine," and indeed, the new System should revitalize nearly every aspect of working on a Mac. Some of the changes are immediately obvious: a reorganized System Folder, multicolored icons, balloon help, TrueType, permanent MultiFinder, aliases, enhanced Finder windows, double-clickable Control Panels and DAs, and a Find command that not only finds but also fetches.

Other improvements are more subtle. For example, the contents of the Apple menu are completely customizable (see Figure 1). In list views, you can look inside a folder without opening a new window (see Figure 2). Open and Save dialog boxes let you "see" the desktop layer. Comments in the Get Info boxes are no longer lost when you rebuild the desktop. There are new keyboard shortcuts for most Finder commands.

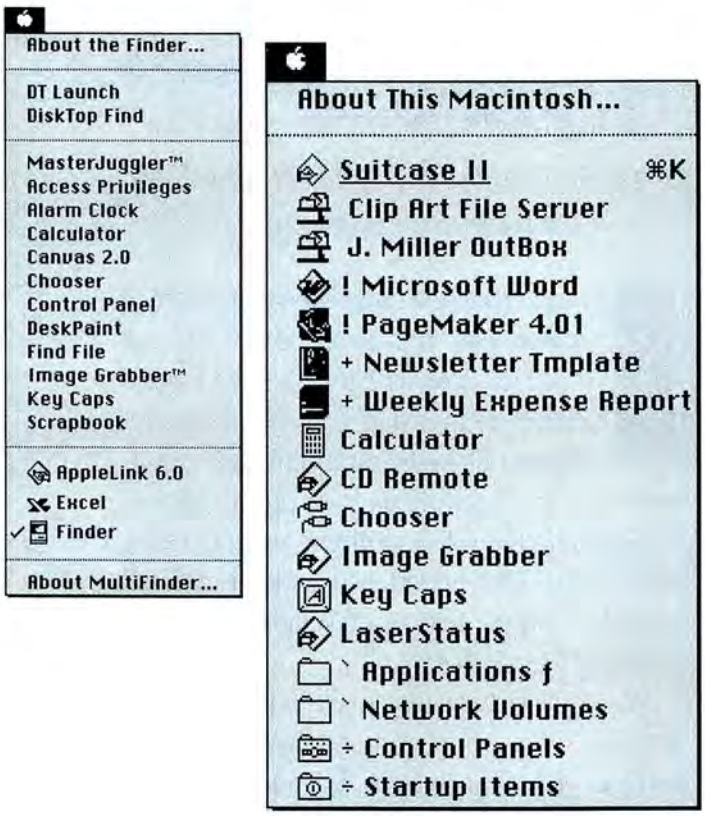


Figure 1: The Apple menu of System 6.x (left) was the home of DAs, a few commands added by certain INITs, and (under MultiFinder) the names of open applications. With System 7.0 (right), you can customize the Apple menu to include items such as applications, DAs, documents, folders, cdevs, and/or AppleShare volumes (or aliases of any of these). To add something, drag it into the Apple Menu Items folder in the System Folder, and it becomes available immediately, without your rebooting the computer.

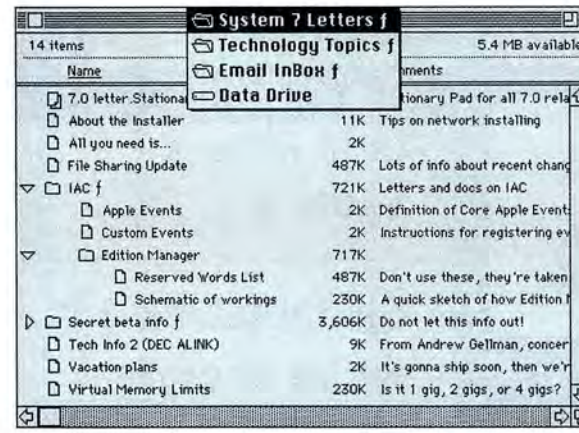


Figure 2: In System 7.0's list views, you can view folders and subfolders hierarchically in a single window — simply click on the triangle to expand or collapse a folder's contents. You can select items from different folders (or levels) at the same time. In addition, list views now provide volume information; you can see folder sizes; and there are columns for file comments, version numbers, and file labels. All Finder windows have a pop-up menu (accessed by Command-clicking on the name) that shows you where the folder is located and lets you move quickly between folder levels.

System 7.0's most important features, however, may be those you can't see — underlying technologies such as IAC (interapplication communication), file sharing, stationery pads, 32-bit addressing, and virtual memory. Some of these will be useful immediately, but others won't have practical application until a new generation of third-party software appears.

Although hundreds of things are new and improved, the Mac interface hasn't really changed, and some enhancements should actually make the operating system faster to learn and easier to use. Most of your favorite applications should make the transition to System 7.0 with no fuss, but they will need to be upgraded to take advantage of features such as publish-and-subscribe and balloon help.

MacUser has been covering System 7.0 for almost two years (see the "Read All About It" sidebar), but as Apple shifts into release mode, it's time for a refresher course. To get you ready for 1991's biggest and best upgrade, here are 70 essential ingredients of System 7.0, including a look at the new lexicon, old versus new desktops, the reasons to convert (in case you're *still* not convinced), tips and shortcuts to make you an instant power user, and a list of some "obsolete" utilities you'll still need.

Read All About It

At *MacUser* we've been waiting for System 7.0 for quite some time, and we have the articles to prove it. Since development of the new operating system was announced almost two years ago, hardly a month has gone by without some *MacUser* coverage, whether it was sneak previews, prognostication, or the announcement of yet another ship date. Most of the job fell to Michael Swaine, whose regular "System 7.0 Watch" (part of his Beating the System column) alerted readers to the finer points of the new System, but other writers had their say too. In case you missed those articles, here's a guide to the best and the brightest, in reverse chronological order. All these articles are available from Library 7 of the Download Forum of Zmac, *MacUser's* on-line service (look elsewhere in this issue for information about how to get connected).

"Applications Are Talking Too," by Michael Swaine, May '91, page 239 —Interapplication communication will change not only what applications can do but also how you use them.

"7.0-Friendly Persuasion," by Kurt W. G. Matthies and Thom Hogan, April '91, page 239— How to write System 7.0-friendly code.

"The Magnificent 7.0," by Kurt W. G. Matthies and Thom Hogan, March '91, page 245 —How to make sure the applications you develop are System 7.0-friendly.

"System 7 Watch: The Virtual Napkin," by Michael Swaine, January '91, page 241 —Collaborative computing has a lot of exciting possibilities; System 7.0 will help developers add collaborative tools to applications.

"System 7 Watch: The Read Balloon," by Michael Swaine, November '90, page 244 — Balloon help and System 7.0's Help Manager let developers add easy-to-read on-screen documentation.

"Sixes and Sevens," by Robert Wiggins, November '90, page 41 — When System 7.0 ships, will you be able to entrust your valuable business data to it right away? A look at Apple's track record for System software reveals the answer.

"Users as Programmers and Users as Programs," by Michael Swaine, October '90, page 258 — The combined power of HyperCard 2.1, System 7.0, and Apple events may turn users into programmers.

"Living with TrueType and System 7.0," by Michael Miley and Paul Yi, October '90, Buyer's Guide page 8—Will TrueType work on PostScript printers?

"Make Room for System 7," by Thom Hogan, September '90, page 321 —How to install System 7.0 and work smarter at the same time.

"Communications Toolbox," by John Rizzo, September '90, page 295—Apple's Communications Toolbox now makes it easier for Mac applications to talk to the rest of the world — and you don't have to install System 7.0 to use it.

"System 7 Watch: A Communication Annotation," by Michael Swaine, July '90, page 229 — Confused about interapplication communication? Here's a guide to IAC's components.

"System 7: Is It Worth the Cost?" by Michael Swaine, June '90, page 252 —A guide to the hardware you need in order to enjoy the benefits of System 7.0.

— Victoria von Biel

16 Glossary Terms

System 7.0 brings with it a brand-new dictionary. Knowing this vocabulary will make you "Seven savvy."

• **Alias:** A duplicate icon for a file, folder, or volume (a disk, partition, or file server). The alias icon can be freely positioned, yet it remains linked to the original file, which allows the file, folder, or volume to act as if it is in two (or more) places at one time. You can have unlimited aliases, all referring to a single "real" file. Double-clicking on or opening an alias opens the original file, folder, or volume. If the original is located on a removable disk, your Mac will prompt you to insert it. Likewise, if it is located on an unmounted network volume, your Mac will prompt you to mount it. Dragging a file into an alias of a folder (or disk) places the file in the original folder.

• **Apple events:** A key component of IAC, this protocol allows two-way communications between applications on a single Mac or over a network. Once programs have been upgraded to implement this feature, they will be able to access each other for a variety of tasks. Some parts of Apple events are defined by Apple; others will be established by Mac developers.

• **Desktop (level):** The Mac has always had a desktop, the physical layer where disk icons and the Trash can appear. System 7.0 adds a logical counterpart to the desktop. Now you can see all the disks (and files or folders) that are on the desktop from inside a Save or Open dialog box simply by clicking on the Desktop button. (Neither the physical nor the logical desktop entities should be confused with the invisible Desktop file the Finder uses to track the contents of a volume.)

• **Edition Manager:** Another part of IAC, the Edition Manager controls the functions of publish-and-subscribe. The Edition Manager is a predefined set of Apple events that, if Apple has its way, will be supported by all Mac applications.

• **Editions:** Files created with the Publish command.

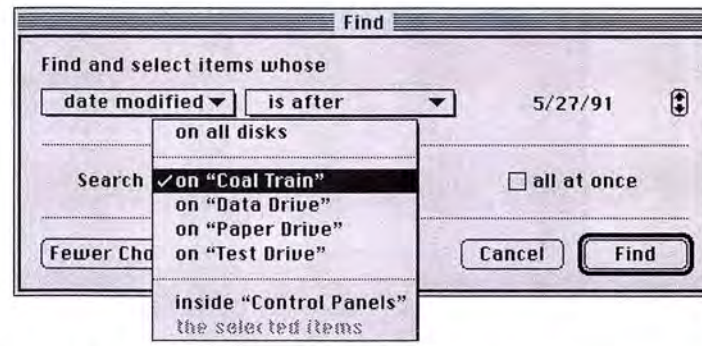


Figure 3: The beefy new Find command offers a variety of search criteria in its More Choices menu, and you can limit the search to a specific disk or folder. The "all at once" check box finds all the matching files and displays them in a list-view window.

Figure 4: Ten Old-Versus-New Finder Features

System 6.x

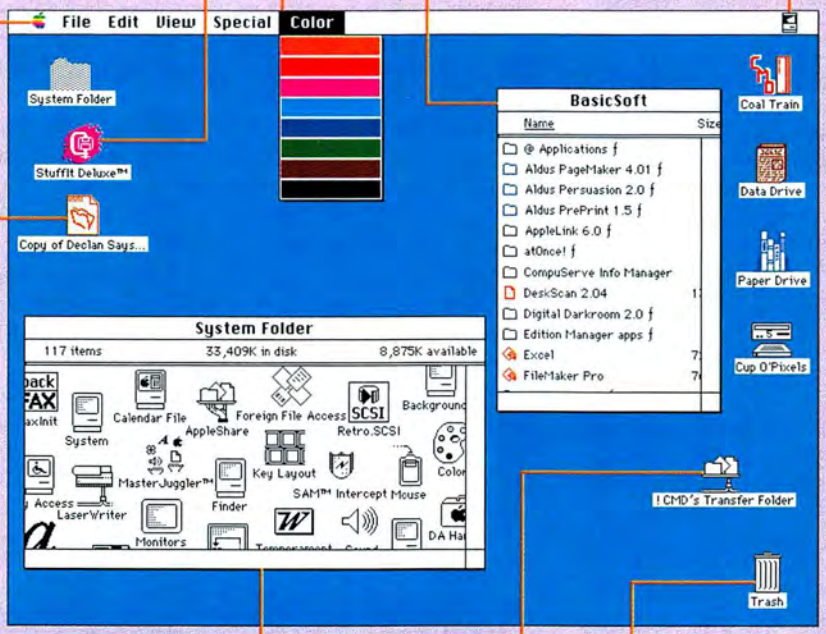
• Desk accessories: DAs must be installed in the System with Font/DA Mover or organized with Suitcase II or MasterJuggler, and then they are available on the Apple menu.

• Icon colors: Icons can be one of eight basic color choices. There are utilities that let you create multicolored icons, but they require ResEdit-level hacking and lots of RAM.

• Color menu: One of the available colors can be assigned to any icon.

• MultiFinder: Available as an option on any Mac with at least 1 megabyte of RAM. Windows of open applications clutter the screen.

• Finder windows: Each window displays the contents of one volume or folder. The window doesn't indicate where the volume or folder is located, and there are few keyboard shortcuts for navigation. Clicking on the zoom box expands the window so that it covers the entire screen.



• Icons: Each file, folder, or volume has only one icon, which can be in only one place at a time. If you want a second copy of a document or application, you must duplicate the original file and the copy consumes an identical amount of disk space.

• System Folder: This is a jumble of System files, INITs, cdevs, fonts, preference files, temporary files, and application-specific subfolders.

• File sharing: Exchanging files over a System 6.x network requires a dedicated file server running software such as AppleShare or TOPS. However, System 6.x users *can* access folders and volumes shared by users on System 7.0 machines; they appear as AppleShare icons on the 6.x desktop.

• Trash: The Trash empties automatically whenever an application is launched or when the Mac is shut down.

• On-line help: The Finder doesn't offer on-line help, and it's far from a standard feature in applications.

System 7.0

• Icon colors: Multicolored icons are supported for all applications. You can substitute your own colorful icons by pasting them over the existing icon image in a file's Get Info dialog box.

• Alias icons: With the Make Alias command, you can create any number of duplicate icons for a file, folder, or volume. The aliases serve as launchable links to the original file and can be placed anywhere on the desktop, added to the Apple menu, or even moved to another machine. Because aliases don't contain the original file, they consume only about 1K of disk space apiece.

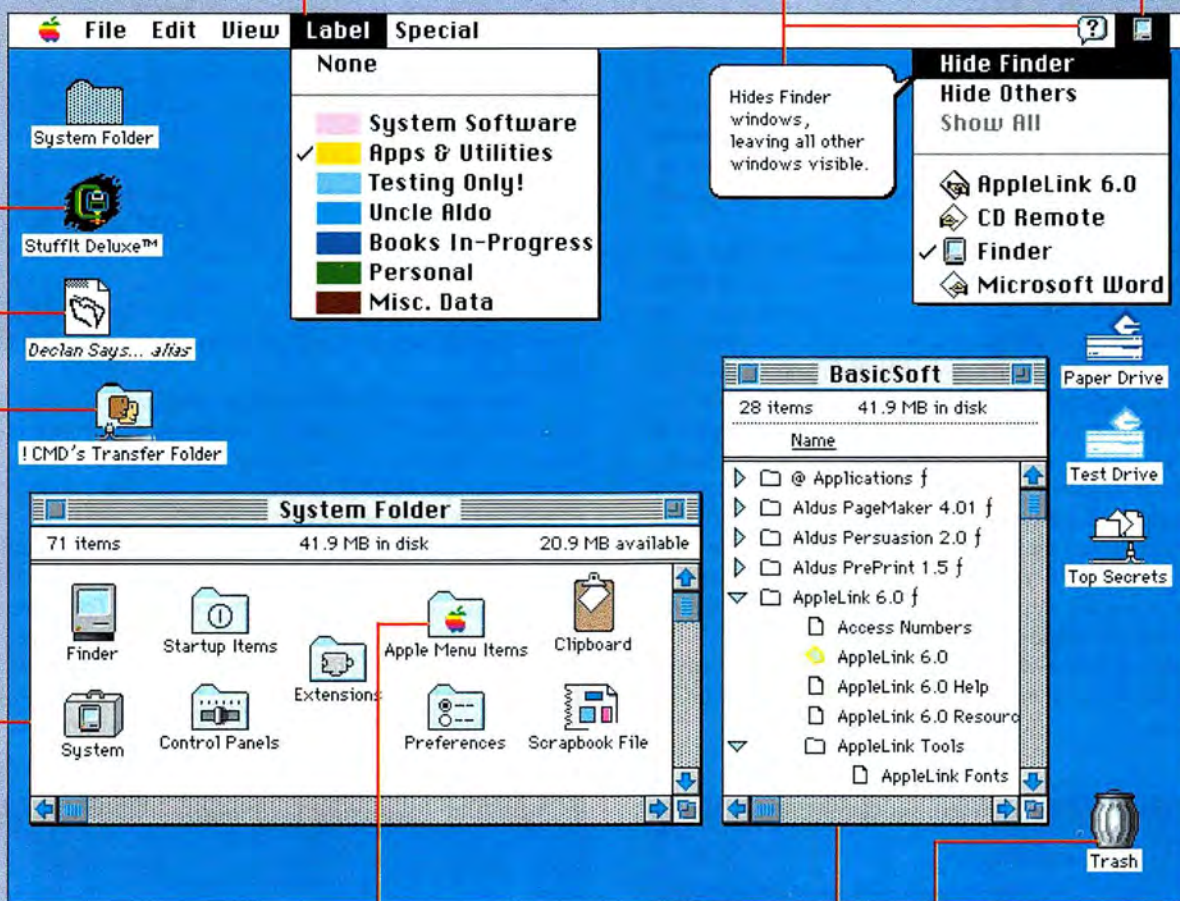
• File sharing: You can share up to ten folders or disks with other users on a network *without a dedicated server*, thanks to 7.0's built-in file-sharing capabilities. Shared folders are indicated by an icon with network cables; the faces appear when someone accesses the folder's contents.

• System Folder: Most items are organized into specific subfolders. Drag an item into the System Folder, and the system automatically puts it into the correct subfolder. INITs and drivers are placed into the Extensions folder, for example, and application-specific files go into the Preferences folder. The System file itself has a new look and functionality: You can open it by double-clicking on it, and it contains only fonts, sounds, and keyboard resources.

• **Label menu:** Labels are identifiers that include a name as well as a color. You can see the name of the label applied to files in all list views, and you can search for files by their labels. The color and name associated with each label can be customized via the Labels cdev.

• **Balloon help:** The new Finder and System 7.0-friendly applications provide interactive on-line help for menu commands, dialog-box options, tool palettes, and other elements. Just choose Show Balloons from the pull-down menu (the icon is at the right end of the menu bar) and move the cursor over an icon or menu item, and a pop-up balloon gives you the relevant details.

• **Multitasking:** MultiFinder is no longer an option — its features are integrated into the Finder and cannot be turned off. The MultiFinder icon has been replaced by the Applications menu, which lists open applications (listed on the Apple menu in System 6.x) and has commands for hiding their windows.



• **Desk accessories:** DAs are double-clickable applications that can be located anywhere. If you still want them on the Apple menu, put them into the Apple Menu Items folder — Font/DA Mover is a thing of the past. (Most of your existing DAs will work in System 7.0, with the expanded freedom of double-click launching.)

• **Finder windows:** A pop-up window in the title bar displays the hierarchical path of that folder or volume. List views are displayed in outline form and have numerous other enhancements (see Figure 2). New keyboard shortcuts let you select files or move up and down the folder hierarchy without touching the mouse. Windows scroll if you move an item beyond the boundaries, and dragging items from background windows no longer makes these windows active. Zooming is intelligent, opening windows just wide enough to let you see all the contents.

• **Trash:** The Trash is a true folder and doesn't empty, even after you've shut down, until you've chosen the Empty Trash command. Also, you can reposition the Trash icon without its snapping back to the lower right corner.

They contain text or graphics that other applications can access by using the Subscribe command. Whenever the original file is edited, the Edition file automatically updates all subscribing files.

• **Extensions:** An umbrella term for INITs, printer drivers, network drivers, and other files that modify the System software. An Extensions folder inside the System Folder is the new home for these files.

• **Font Scaler:** The small program that is automatically sent to PostScript printers whenever documents containing TrueType fonts are printed. It enables the printer to rasterize (image) TrueType fonts.

• **IAC (interapplication communication):** A set of protocols that enables Mac applications to communicate at various levels. Its parts include Apple events (two-way communication) and the Edition Manager (one-way communication via publish-and-subscribe). Once its components have been implemented by new or upgraded applications, IAC will let applications share features with each other.

• **Publish-and-subscribe:** Sometimes called "live copy-and-paste," this feature lets you pass text or graphics among applications while retaining a dynamic link to the original file. In a publish/subscribe linkage, one application is the publisher, which makes selected material available to other applications. Other applications are subscribers, which can incorporate the published material (called an Edition) into a document. The copied material remains linked to its source, so that whenever the original material is changed, all subscribing files are automatically updated, whether or not they are open — even over a network. Publish-and-subscribe will be available only in applications with the necessary code, which will make the relevant commands available on the Edit menu.

• **Seven-Point-Oh:** The correct pronunciation of the new System version — at least until Seven-Point-Oh-One arrives.

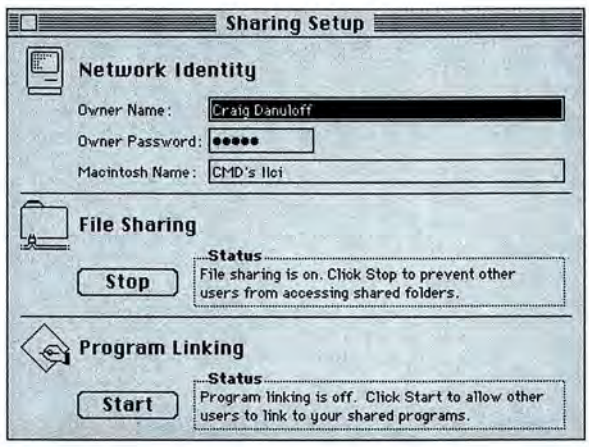
• **Stationery pad:** A template (or master file) that is automatically duplicated when opened, thus preventing the original file from being overwritten. You can designate any file as a stationery pad by clicking on the appropriate button in a Save As or Get Info dialog box.

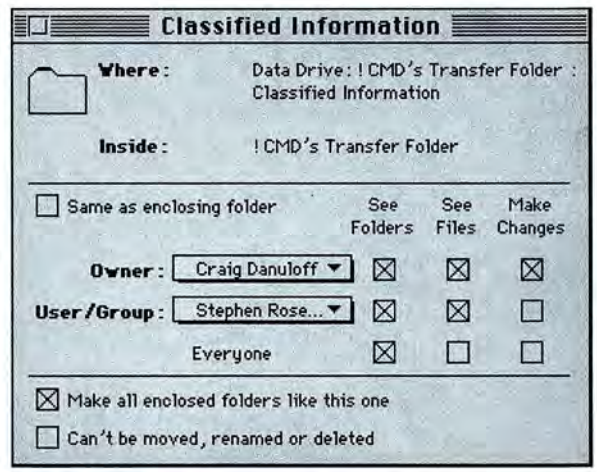
• **System 7.0-friendly:** The official Apple appellation for applications that have been upgraded to take advantage of the special features of System 7.0. Apple's checklist includes support for TrueType, multitasking, publish-and-subscribe, Apple events, balloon help, file sharing, and 32-bit addressing. If an application runs fine under System 7.0 but doesn't include all of these features, Apple will not accord it "friendly" status; instead, the uncool application is termed *System 7.0-compatible.*

• **32-bit addressing:** A new method of handling memory that enables "32-bit-clean" machines to access much larger amounts of RAM and virtual memory. At this writing, only the Mac LC, IIci, IIsi, and IIfx support 32-bit addressing. This scheme lets these machines access as much as 128 megabytes of physical RAM and up to a whopping *gigabyte* of virtual memory (the LC doesn't support virtual memory). The current standard, 24-bit addressing, is still supported on all other Macs and for those applications that are not compatible with 32-bit addressing.

• **TrueImage:** The PostScript-language-interpreter clone developed by Microsoft. Although TrueImage is not part of System 7.0, TrueImage printers, such as the LaserMax LaserMaster 400XL, provide direct ROM-based support for both PostScript and TrueType fonts.

• **TrueType:** The new outline-font technology created by Apple. Unlike bit-mapped (or fixed-size) fonts, which require separate data files for each point size, TrueType fonts use a single font-outline file to scale fonts to any size. And unlike with Type 1 fonts, no separate bit-mapped font file is required for output. TrueType fonts have smooth, high-resolution display on-screen and can be printed at





the maximum resolution of PostScript, TrueImage, or QuickDraw printers.

• **Virtual memory:** A scheme that enables some Macs to use vacant disk space on hard disks as RAM so applications can have additional memory. Virtual memory requires a 68030 or PMMU chip, which limits it to the SE/30 and Mac II family. Machines that also support 32-bit addressing (the IIsi, IIci, and IIfx) can access up to 1 gigabyte of virtual memory. The default setting, however, is twice the machine's installed RAM. Bear in mind that virtual memory is likely to be slower than real RAM and that not even Apple recommends it for everyday use.

10 Reasons to Convert

For those of you who still need some convincing, here are the top ten reasons why you should make the switch to System 7.0:

• **TrueType:** Apple's new scalable-font technology is now built in to every Mac, giving users the benefits of smooth type at sizes from 1 to 32,768 points, on-screen as well as on paper. Installation is a breeze, and you can see type samples by double-clicking on the font icon (see Figure A). Unfortunately, System 7.0 is not as kind to PostScript Type 1 fonts (see the "Type 1 Fonts: Second-Class Citizens?" sidebar). Apple will provide four TrueType fonts with System 7.0 — Times, Helvetica, Courier, and Symbol — and you can expect hundreds of other TrueType fonts from companies such as Bitstream, Agfa Compugraphic, and Monotype by the end of 1991.

• **Aliasing:** Imagine that you could keep every file from every disk, cartridge, and network server you have access to — on *your* hard disk. Imagine that you could arrange your work by the date it was created, by the topic (or topics) it relates to, by the application used to create it, and alphabetically by filename — *all at the same time*. And finally, imagine that logging on to a file server or someone else's hard disk was as easy as double-clicking on an icon. Aliasing makes all these dreams come true.

• **Finder windows:** Organizing and accessing files is *much* easier with the powerful new tools provided in the Finder windows of System 7.0. These include hierarchical display of folder contents, keyboard commands, automatic scrolling, and more (see Figure 2).

• **Multitasking:** If you haven't been using MultiFinder, the gentle push of System 7.0 will introduce you to the world of doing two (or more) things at once. System 7.0 eliminates the distinction between the Finder and MultiFinder. You can *always* open more than one application at a time, memory permitting. You can hide open applications when you're not using them, and multitasking even lets you do other work while files copy in the background.

• **Find command:** A fast, powerful file-searching utility is available from the File menu or from the keyboard (see Figure 3). You can search for files by name, creation or modification date, size, label, or comments — and you can even do two-stage searches. When a file is found, its folder window automatically opens.

• **File sharing:** If you're part of a network, you can share any folder or volume on your hard disk with other users — without using a dedicated server (see Figure 5). Using the Sharing command from the File menu, you can make as many as ten folders or disks available to other users (you can have an unlimited number of folders within shared folders/disks). You decide who can access the information and what their privileges are; users access the shared folder/disk by selecting it in the Chooser, and it looks just like an AppleShare volume on the desktop. You can also share files with users running System 6.x and with PC users, even though their systems don't have native file-sharing capabilities. There are some practical limits: Only ten users can access your Mac simultaneously, and you will experience some performance degradation during file access.

• **Customization:** Personalization becomes productive

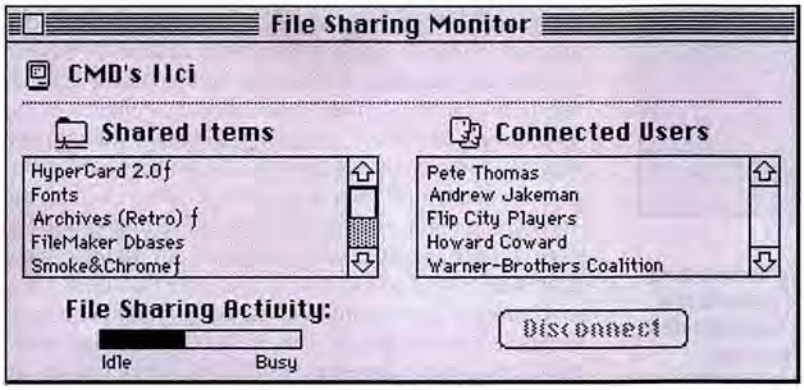
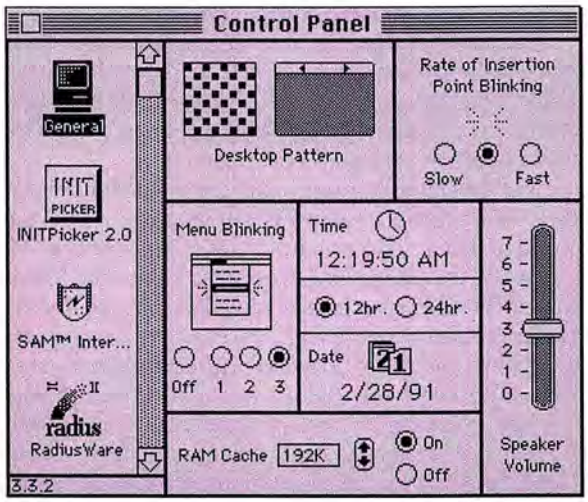
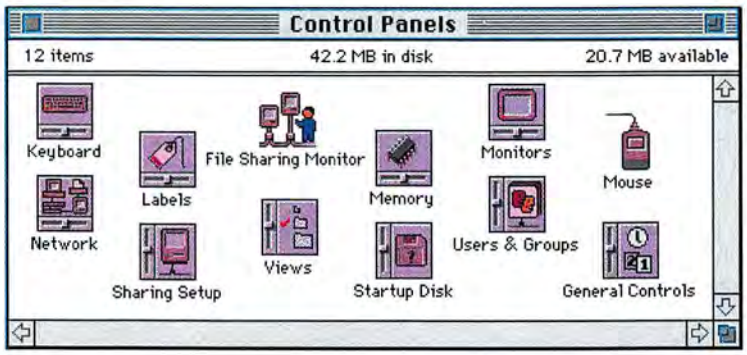


Figure 5: System 7.0 provides new cdevs for controlling network access and file sharing. The Sharing Setup cdev (far left) is where you identify your Mac to the network and switch on program linking (the various components of IAC). To share a folder, you select it, choose Sharing from the File menu, and set privileges in the resulting dialog box (center). If other users want to access the folder, they simply select it from the AppleShare list in the Chooser and it appears on their desktop as an AppleShare icon. The File Sharing Monitor cdev (near left) lets you see what items are being shared and which users are currently accessing them.





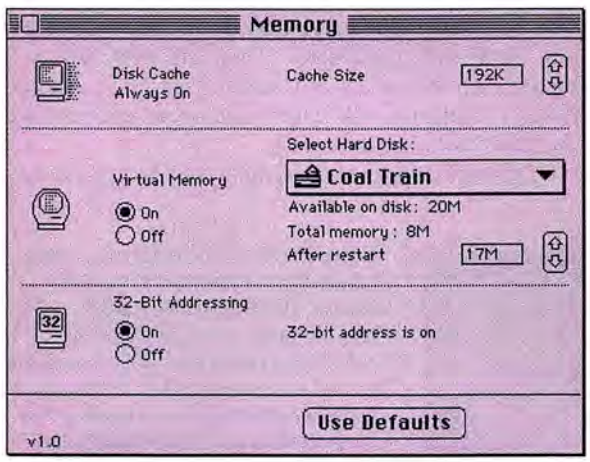


Figure 6: Under System 6.x, the Control Panel DA provided a shell for accessing cdevs (top); its scrolling list allowed access to only one cdev at a time. System 7.0 supports cdevs as launchable files (just like applications and DAs) and adds several new ones (center), such as Views, Sharing Setup, and Memory (bottom). You can place cdevs on the Apple menu via the Control Panels folder or as individual items. Multiple cdevs can be open simultaneously, and they can display windows of any size.

as you customize the contents of your Apple menu, define categories for the Label menu, and choose what columns of data are presented in Finder windows.

• **Publish-and-subscribe:** If you move text or graphics between files — using import commands, the Clipboard, or the Scrapbook — the ability to create and control live links between imported data and the original documents will make it much easier to create timely and accurate documents.

• **Apple events:** One of the most far-reaching aspects of System 7.0, Apple events will enable applications to work cooperatively, exchanging information and even controlling each other. For example, a word-processing program could ask a spreadsheet program to perform calculations, or a CAD program could trade information with a parts database. Naturally, Apple events must first be incorporated into the participating applications for this to happen.

• **32-bit addressing and virtual memory:** System 7.0's 32-bit-addressing scheme makes it possible to have almost unlimited physical RAM, when or if you can afford it. Virtual memory lets you simulate even larger amounts of RAM, using the free space on your hard disk (see the Memory cdev in Figure 6).

5 Improvements to Existing Features

Almost everything about the System software has been updated, but here are five more reasons to smile:

Installing fonts and DAs: Apple's most nonintuitive utility has finally been laid to rest. The infamous Font/DA Mover copied fonts and DAs into the System file or between suitcase files. With System 7.0, you install fonts (TrueType or bit-mapped) simply by dragging their icons into the System Folder; they are automatically placed in the System file (which can be opened to reveal what's already there). DAs are launchable applications that can be placed anywhere. If you already have suitcases of fonts or DAs, you can drag them into the System Folder and they'll automatically be installed.

File dialog boxes: The Open and Save dialog boxes in System 6.x offered few keyboard shortcuts and provided no way to move directly to a specific volume. In System 7.0, the big change is the Desktop button, which replaces the Drive button. It displays a list of the contents of the Finder desktop (disks, partitions, files, and folders) and lets you directly access any item. More keyboard shortcuts are available (Command-right arrow takes you to the next volume, for example), and the Save dialog box has New Folder and Stationery buttons. Long filenames are compressed so you can read them in the limited space.

Chooser: The revamped Chooser lets you have almost unlimited zones (with a limit of 16,000 nodes per zone) and can display names up to 32 characters long in an alphabetized list. You can quickly select a zone name by typing in the first letter or two. The user name is now part of the Sharing Setup cdev (see Figure 5).

Type 1 Fonts: Second-Class Citizens?

With the introduction of TrueType, Apple raises the type-quality baseline for nearly every Mac user. Users of System 6.x and 7.0 can take advantage of this new outline-font technology, and System 7.0 users get an added benefit: They can say goodbye to the Font/DA Mover. To install bit-mapped and TrueType fonts in System 7.0, you need only drag font icons into the System file, which now acts like a folder for collecting fonts and sounds.

You might assume that Apple has provided an equally elegant solution for users of PostScript Type 1 fonts. After all, it was Apple that got Mac owners using Type 1 font technology in the first place, through its introduction of the first PostScript printer, the original LaserWriter. Thousands of Mac users have invested millions of dollars in Type 1 fonts. So you might make assumptions — but you'd be wrong. System 7.0 offers no friendly new interface for working with Type 1 fonts — quite the contrary.

Type 1 fonts still work, and so does ATM (Adobe Type Manager). But under System 7.0, Type 1 outline fonts are filed in the Extensions folder (located in the System Folder), along with printer drivers and INITs — a natural home for a font, don't you think? With a little more effort, Apple could have provided a minimally clean solution, such as a special PostScript Type 1 folder. And although System 7.0 users can double-click on a bit-mapped or TrueType-font icon to display type samples (see Figure A), this trick doesn't work with Type 1 outline fonts.

Those who use Suitcase or MasterJuggler in conjunction with ATM to turn fonts on and off are also in for some interesting System 7.0 surprises. But you'll have to wait until all the beta dust settles for the full report on *that* adventure.

— Henry Bortman

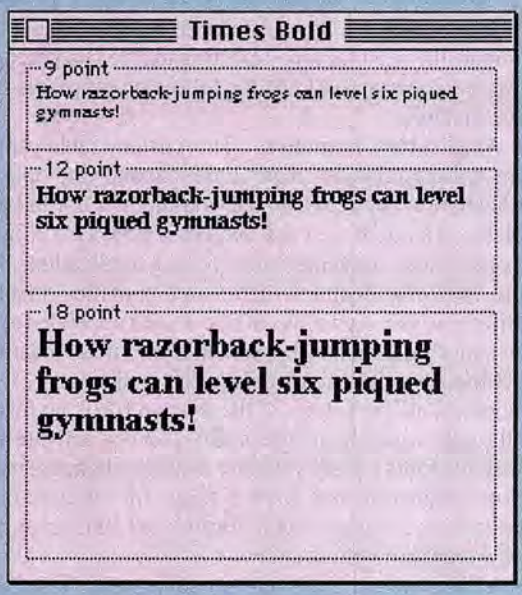


Figure A: If you double-click on a TrueType font icon, you'll get this handy type sample.

Get Info boxes: In System 6.x, comments were accessible only through a file's Get Info box and were lost whenever the Finder's invisible Desktop file was rebuilt or replaced. System 7.0 makes these comments permanent entities, and they serve a true informational function. You can optionally display comments in all list views, and the File command can search for files based on comment text. The Stationery option lets you turn a file into a template; double-clicking on its icon then opens a copy of the file.

System stats: In System 6.x, the Apple menu's About the Finder presented basic information about System software, available RAM, and memory use by open applications. The window could be scrolled but not resized. System 7.0's About This Macintosh improves the quantity and quality of information. This resizable dialog box displays the name and icon of the Mac model and the System-software version as well as information about the available RAM, virtual memory, and application memory usage.

16 Tips and Shortcuts

OK, enough about file sharing and IAC. Here are the goodies you *really* want to know about:

• **Keyboard shortcuts in Finder windows:** You can navigate within a window by using the arrow keys. Command-down arrow opens a selected file or folder (additionally holding down the Option key closes the current folder); Command-up arrow opens the parent folder or volume window (adding the Option key closes the current folder). The Tab key moves you through files alphabetically. Type the first characters of a filename to jump to a particular file. Command-W closes the active window. In list views, press Command-Option-right arrow to expand the entire outline and Command-Option-left arrow to collapse it. (More shortcuts are now listed on the Finder's Help menu.)

• **Sorting icons:** Holding down the Option key while selecting the Clean Up command lets you sort file icons. To choose the type of sort, select a list view (such as View by Date) immediately before selecting View by Icon or View by Small Icon. Using the View Control Panel's new Staggered Grid and Snap To Grid options helps Finder windows stay tidy even before cleanup (see Figure 7). Holding down the Command key as you drag icons toggles the Snap To Grid option on and off temporarily. In list views, clicking on a column title sorts files by that field.

• **Opening documents:** You can open a document by dragging its icon onto the icon of an application, provided that the program supports the document's format. This lets you open a file in programs other than the one that created it (for example, open a MacWrite file in Word).

• **Drag-selecting in list views:** You can now select multiple items with a marquee even in the Finder's list views. Previous System versions required you to Shift-

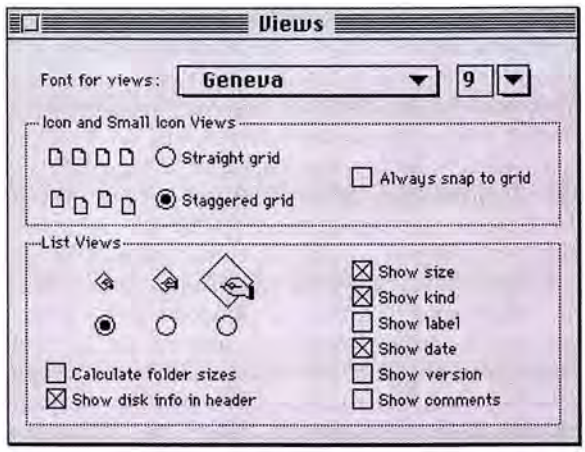


Figure 7: The new Views cdev lets you customize how icons and lists are displayed in Finder windows. The result is tidier icon views and more-informative list views.

click on each individual file, except when viewing icons.

• **Background copying:** You can copy files in the background while continuing to work in an open application. You can't launch a new application while copying is in progress, however.

• **Locating the original file for an alias:** Need to find the real McCoy? Go to the Get Info box for the alias, and click on Find Original. The Finder window containing the original file opens, and the icon is highlighted.

• **Crash recovery:** If you crash in any application under System 7.0, you can usually recover to the Finder by pressing Command-Option-Shift-Escape and clicking on OK in the resulting Force Quit? dialog box. To be safe, you should then immediately close all applications and reboot your machine.

• **Closing/hiding windows:** The Option key brings new flexibility to window management in the Finder. Holding down the Option key when you launch an application closes the window containing the application icon. Using it as you bring a background application to the foreground hides the current application. Pressing the Option key and clicking on the desktop hides all the open application windows.

• **Publisher/subscriber options:** You can see what material in a document has been published or subscribed to by selecting the Show Borders command. This places a gray border around all the sections that are published or subscribed to. Double-clicking on this border brings up either the Publisher Options or the Subscriber Options dialog box, which include options for updating or canceling editions.

• **Disabling Extensions:** Holding down the Shift key while the Mac starts prevents the launch of all INITs in the Extensions, Control Panels, and System folders. You must restart the machine to turn them back on.

• **Using Put Away to eject disks:** The File menu's Put Away command (Command-Y) ejects and/or dismounts disks, removable media, or file-sharing volumes.

• **Using special characters to arrange files:** Add special characters to the beginning of filenames to force grouping in the Apple menu (or in list views). For example, placing an exclamation point (!) in front of application names groups them at the top of the Apple menu, and adding the grave accent (`) character to folder names moves them to the bottom (see Figure 1). You can also start a filename with a space.

• **Saving desktop patterns:** If you like to create custom patterns for your desktop instead of using the default patterns in the General cdev, you now can save them by double-clicking on the cdev's miniature desktop. No longer will your handiwork disappear forever as soon as you choose another pattern.

• **Color screen shots:** Pressing Command-Shift-3 takes a color PICT snapshot of your screen, complete with a camera-shutter sound effect. (In previous Systems, this command produced only a black-and-white MacPaint file.) These PICT files will open in an enhanced version of TeachText if you double-click on them.

• **Emptying the Trash:** If you don't want a warning message every time you empty the Trash, turn off the appropriate button in the Trash's Get Info box.

• **About the Finder:** Holding down the Option key when you select About This Macintosh from the Apple menu changes it to About the Finder, which displays an updated System-software copyright notice.

7 'Obsolete' Utilities You'll Still Need

Theoretically, the new features in System 7.0 should eliminate the need for many existing utilities. In practice, however, you may find that the following programs still come in handy:

• **Application launchers:** The customizable Apple menu and the ability to create aliases expand your options for launching applications, but you might want to keep DiskTop, HandOff, or On Cue. These powerful utilities are often more convenient for opening applications, because they offer features such as a hierarchical display (letting you have submenus of documents appended to an application) and menus that pop up at the cursor location.

• **Suitcase or MasterJuggler:** The manual process of dragging fonts into or out of the System file is no match for the ease with which these utilities let you activate and deactivate fonts — and you may consider them essential if you continue to use Type 1 fonts. In addition, both support Fkeys (which Apple forgot) and MasterJuggler does a great job with sound.

• **ATM:** System 7.0's built-in support for TrueType fonts is great, but for all the existing PostScript Type 1 fonts, ATM is still a must-have utility (see the "Type 1 Fonts: Second-Class Citizens?" sidebar).

• **Shortcut or Boomerang:** The Desktop button adds flexibility to the navigation of dialog boxes, but these utilities provide a wider range of features, such as the ability to go directly to a commonly used folder. Fortunately, both are already System 7.0-compatible.

• **Aask or INIT Manager:** System 7.0's all-or-nothing INIT management provided by the Shift key is vastly inadequate for juggling the complex array of INITs that today's Mac users have installed. You should be able to selectively turn individual INITs on and off, just as you can with these two utilities.

• **AppleShare:** Built-in file sharing has its limits, allowing only ten folders or volumes to be shared and significantly slowing your Mac when others access it. In short, file sharing is a tremendous feature, but it doesn't eliminate the need for more-robust network file servers.

• **ResEdit:** Although you can now see what's in the System file by double-clicking on it, the only resources this technique lets you access are fonts, sounds, and keyboards. You still need ResEdit to get at keyboard equivalents, dialog boxes, and icons.

Craig Danuloff has waited 18 months for Apple to ship System 7.0 so he could publish *The System 7 Book* (Chapel Hill, North Carolina: Ventana Press). He is also the coauthor of *Encyclopedia Macintosh*. Senior editor Aileen Abernathy has begun researching an article on System 8.0.

Completing the System

System software encompasses much more than the files that come with System 6.x or System 7.0. Most Mac users rely on some third-party software in the form of INITs, cdevs, and other utilities. Programs such as Suitcase, Boomerang, On Cue, Shortcut, and DiskTop smooth over the rough edges of Apple's System software — or add completely new abilities. For power users, these programs are what have made the sometimes unwieldy System 6.x — with its nested folders, limited support for DAs, and confusing font installation — bearable.

When System 7.0 ships, some of your favorite utilities will become obsolete, because Apple has incorporated many of their features directly into System 7.0. Even so, System 7.0 still lacks some useful features, such as Boomerang's ability to remember recently accessed files. Apple has also implemented completely new features, such as aliasing, without including every conceivable option. You might say that Apple provides the basic car and it's up to third parties to add such goodies as cellular phones and alarm systems.

Here, then, are some suggested improvements to System 7.0 that could put a budding programmer on the map:

• Aliases are undeniably powerful, but they introduce a potential for clutter, because deleting a file doesn't delete its aliases. One answer might be an extension (which is what INITs have become in System 7.0) that automatically deletes aliases at the same time as the original file. Another useful utility could let users periodically sweep their disks for unattached aliases and give them the option of deleting them.

• The Apple menu's role is much expanded in System 7.0. Unfortunately, the menu can get crowded very quickly, and Apple gave it no hierarchical capability. If you place a folder in the Apple menu, selecting that folder simply opens it on the desktop. A faster, more elegant solution might be to let users *create* folders within the Apple Menu Items folder in the System Folder and then have those folders act as hierarchical menus. This would mean that you could create a folder within the Apple Menu Items folder and call it Applications. You could then place application files (or their aliases) in the Applications folder. When you pulled down the Apple menu and reached the Applications folder, a submenu containing all the applications in that folder would appear to the right of the Apple menu. Then you could select the one you wanted. Another example: When you selected the Control Panels item, you could get a submenu showing a list of all cdevs instead of an open window full of Control Panel filenames.

• System 7.0's enhanced list views are efficient ways to explore nested folders. But if you want to jump from a file or folder to the folder that contains it, you can't do it by using the keyboard. This often means having to scroll the window before you can select the desired folder or file with the mouse. How about a way to do this from the keyboard?

• MultiFinder is a permanent resident of System 7.0. Memory permitting, you can now have multiple applications open all the time. But Apple moved the MultiFinder part of the Apple menu (which told you what applications were loaded in memory and which one was currently active) to the right side of the menu bar as part of the new Applications menu. For users with a big screen, mousing all the way to the right in order to switch applications or see which ones are open can quickly become tiresome. Two as-yet-unwritten solutions: a way to cycle through currently open applications or an extension that puts a bullet next to open applications in the Apple menu.

• Here's another feature that could help manage all the simultaneously open applications, and it's one that already exists on other platforms such as the Sun and NeXT workstations. Currently, if you have open applications, the Applications menu has a command that lets you hide them. It closes all the windows associated with a particular application. This is an improvement over System 6.x's MultiFinder, which made you close each window individually. It would be more useful if you could *tokenize* your applications (and any associated open document files). This would close the application's windows but leave a token (a special kind of icon) on the desktop that you could click on to reopen everything quickly. You could then pick up exactly where you'd left off.

• System 7.0's standard File dialog box could host several useful options. How about a button that let you automatically create an alias for a file the first time you saved it or let you add comments when saving?

People are certain to find creative ways to exploit or augment other System 7.0 features, such as file sharing, balloon help, labels, and TrueType. Apple may have spent years deciding what features to include in System 7.0, but the final decision really belongs to the users.

— James Bradbury

The World's Smallest Hard Drive And

The leading innovator in peripherals for use with Macintosh computers is back with another breakthrough product.

Jasmine Technologies presents The Clipper, the world's smallest hard drive. The Clipper fits easily into your shirt pocket or briefcase, and plugs directly into any Macintosh computer.

The entire unit is about the size of a wallet and weighs less than 10 ounces, but it's able to withstand a shock of over 100G's. And comes with a 2 year warranty with a 5 year extension available.

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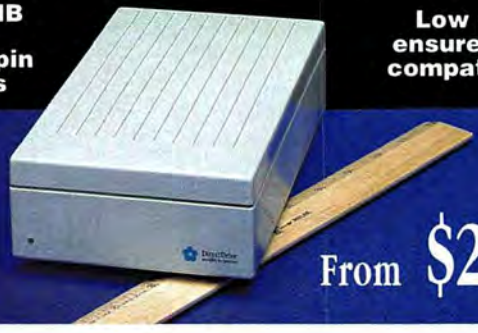
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Data on the Run

With a palmtop organizer, you can share your schedule and phone books with your Mac and then leave the Mac behind.

BY DARRYL LEWIS

PHOTOGRAPHY: PIERRE-YVES GOAVEC

Which came first, the yuppie or the Filofax? Well, it doesn't really matter, because both are passé. Today's personal information managers are *palmtop* info managers, electronic marvels that look like calculators on steroids.

The Sharp Wizard OZ-8000, the Casio B.O.S.S. 9500, the Poqet PC, and the Atari Portfolio are the best examples of their genre. The Wizard and the B.O.S.S. are electronic "daytimers," and the Portfolio and the Poqet PC are computers that include daytimer functions. All the units offer

- A current-date-and-time display
- A calendar display
- A phone-book database
- An appointment-book database with optional advance alarms for each appointment
- A mini word processor for entering memos and notes
- A calculator.

A PIM on Your Wrist



The WristMac is a souped-up Seiko wristwatch with a Mac-interface port.

The WristMac is a Seiko watch with a large LCD screen. It can store up to eighty 24-character screens, each of which can be a schedule alarm, a daily or weekly alarm, a name and phone number, a to-do reminder, or any other text.

The screen is arranged as 2 lines of 12 characters each. In alarm screens, 12 of the 24 characters are used for date and time information, leaving only 12 for the reminder message. When the alarm sounds, its associated screen appears on the WristMac and remains displayed until you change or delete it.

The WristMac includes a communications port, and the supplied cable connects it to the Mac's printer or modem port and a HyperCard stack that stores and transfers the data.

The WristMac's screens are too small to display meaningful schedule information. Like the Poqet PC, the WristMac is another expensive conversation piece.

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Tampa, FL 33634
(813) 882-8635
Standard WristMac, $145
Pocket WristMac, $195
Gold and Silver Executive WristMac, $245
(Software, cable, and clip are included in the above prices.)

All of the units can exchange information with a Mac, using proprietary software and a cable or a modem. Testing these products involved transferring schedules and phonebook and memo information from the Mac to the palmtop, using that information during a typical business day, and transferring changes back to the Mac. Only one of these units was capable of handling all these tasks, albeit imperfectly. Although the Atari and Poqet PC are computers, they were tested as daytimers, and even simple tests revealed shortcomings that would keep them from being the first choice in a portable computer.

Screens, Keyboards, and Memory

Each palmtop unit has an LCD screen, adjustable for viewing angle and contrast. None is backlit, so all are unreadable in low light.

The small, QWERTY keyboards on all four have buttons rather than membrane switches. None has a separate numeric keypad. You wouldn't want to do much word processing on any of them, but for this purpose, the Poqet PC and Wizard palmtops outshine the others.

All these units store information in RAM that retains data even when the unit is off. They warn you when the batteries are low and let you change the batteries without suffering data loss.

When closed, none of the units is more than four inches deep and an inch thick, so they easily fit into a briefcase — or even a pocket, provided you have big pockets.

Sharp Wizard OZ-8000

The Sharp Wizard OZ-8000 has the most Mac-like interface in the group. It has 64K of RAM (Sharp also markets a 128K version, the Wizard OZ-8200). You access each built-in function by pressing an icon-imprinted button. The easy-to-read screen displays either 8 lines of 40 characters each or 4 lines of 30 larger characters each. The keyboard ranked second only to that of the Poqet PC and could almost be used for touch-typing

In addition to the standard functions all the units offer, the Wizard features an outliner; terminal emulation; a world-time function; and the ability to mark individual entries as secret, effectively password-protecting them.

Each new appointment, memo, and phone entry in the Wizard occupies its own index card and may contain as many as 2,048 characters. Once the data has been entered, the Wizard can display it in several useful list formats. For instance, appointments can be viewed in a daily or weekly list, and the phone list displays each name with its number. To get an address, you select an entry and switch to the index-card view. When displaying the calendar, the Wizard shows two months side by side, with marks beside those dates with appointments.

A 24-hour time line that marks the beginning and end of timed appointments is included in both the daily list and the index-card appointment views, providing a quick overview of your day.

Finding a specific appointment, phone entry, or memo is

like using a word processor's Find command. After you've entered a string of characters, the Wizard can find the next record that either begins with or contains that string.

In addition to timed appointments — with or without advance alarms — the Wizard supports several other kinds of appointments. Those with no specified time are treated as to-do items and appear at the top of the daily list. Appointments can also cover periods of time, such as vacations, and you can store repeating events by month and date or by month and weekday.

The Wizard has four phone-book files, which makes it easy to keep business and personal phone-number entries separate. The three standard phone-book files have predefined fields for name, phone number, and address as well as five user-definable fields. The business-card file includes predefined fields for company name, department, phone number, fax number, office address, personal name, position, and phone extension or direct number as well as five user-definable fields.

The calculator works either as a standard pocket calculator or as a "paperless printer" in which entries and results appear in a simulated scrolling adding-machine tape.

Both Sharp and Traveling Software market software/cable combinations that allow data transfer between the Mac and the Wizard. Unfortunately, both software packages were written for earlier Wizard models with smaller feature sets, so the links don't take advantage of everything the OZ-8000 offers.

Sharp's software is a HyperCard stack without list views, making it impractical for office use on the Mac. Traveling Software's application has list views, but the windows are often too small. In addition, all appointments entered without a starting time automatically default to 12:00 A.M. when they are transferred to the Wizard.

In an effort to circumvent the link packages' limitations, I tried using the Wizard's terminal-emulation mode to transfer appointments and phone books in text form. Unfortunately, the terminal emulation saves files only in the Memo mode.

Ultimately I exported my appointments as a text file from Alarming Events and exported my phone records as text from a Works database. Since Sharp's Organizer Link software is capable of transferring text files to the Wizard, I used this method to load it, but I couldn't import anything into the Business Card or Outliner area and I couldn't import anything into the free fields in the phone books.

A caveat about the Wizard OZ-8000: Its availability is currently extremely limited.

Casio B.O.S.S. 9500

After the Wizard, the Casio B.O.S.S. 9500 is the easiest unit to use. Although most of its keys are located on the keyboard, the function buttons are membrane keys on the top half of the "clamshell." The B.O.S.S. screen clearly displays 6 lines of 32 characters each. Its keyboard buttons, smaller and more closely spaced than the Wizard's, make touch-typing impossible.

The B.O.S.S. features world-time, secret, and mark functions in addition to the standard functions. The secret function is used for password protection, and the mark function prevents data deletion.

Data entry with the B.O.S.S. is more complicated than it is with the Wizard. It can take a dozen steps to enter an appointment. By contrast, the Wizard requires only six and there are fewer buttons to remember.

Appointment, phone, and memo entries in the B.O.S.S. may contain as many as 384 characters. Appointments are always displayed in a single, scrollable list. The date on the top line of the display changes to reflect that assigned to the appointment, and the appointment listing begins on the next line down. In the calendar view, the B.O.S.S. display is nearly identical to that of the Wizard. Phone-book files can be displayed in either index-card or list format.

The B.O.S.S. has two phone-book files. The standard file includes predefined fields for name, phone number, and address as well as six user-definable fields. The business-card file includes fields for employer, name, phone number, position, department, P.O.-box number, address, telex number, and fax number as well as six optional fields. Unlike that of the Wizard, the B.O.S.S.' business-card file is a relational database that stores company information in one file with links to a separate contact-information file. The B.O.S.S. also supports multiple-criteria searches.

The CasioLink Mac personal-data-management software is eminently usable. It addresses all the functions of the B.O.S.S., and data transfers are straightforward and quick.

Poqet PC

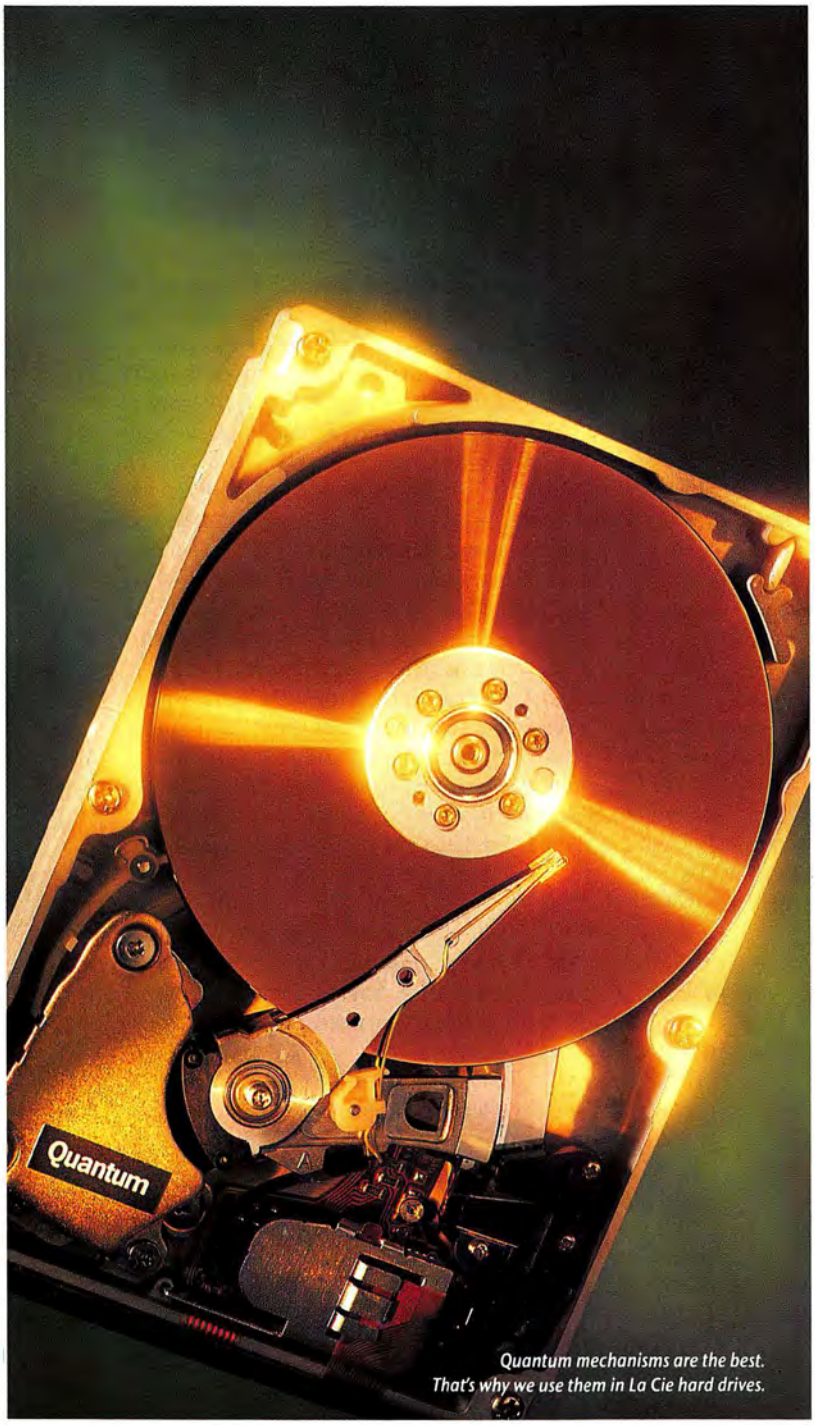
The Poqet PC is a full-blown DOS computer with 512K of RAM, so you have to learn some keyboard commands and use DOS-style menus to issue the rest. It puts the power of a PC in to the hands of those who need more than a simple daytimer.

The C drive is built in to the Poqet PC's ROM and contains DOS and a collection of built-in daytimer functions, called PoqetTools. It's nice that DOS doesn't occupy valuable RAM, but applications written to run from the C drive can't be copied to it and may not run at all.

In addition to the standard functions, PoqetTools includes a communications program. A null-modem cable for PC-PC data transfers comes with the unit, but it doesn't work with the Mac. I tested my unit with a copy of Lotus' AlphaWorks — an integrated package similar to Microsoft Works — which saves all files in common formats usable by other PC and Mac applications.

The Poqet PC was the largest of the tested units. The screen displays 25 lines of 80 characters each in text or CGA mode, but the small character size and excessive reflectivity make it the least readable display in the group. The Poqet PC's keyboard had the largest keys and the best feel, but

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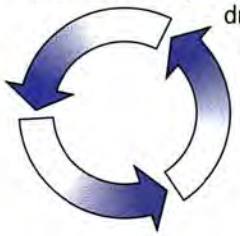
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typing was equally quick and accurate on the Wizard.

The Poqet PC's daytimer functions are well designed. Entry length is limited by available RAM, and the number of appointment, phone, and memo files is limited by available RAM or storage space. Additional storage space is available in the form of plug-in RAM cards (up to 512K on each) and the Poqet PC's 3.5-inch PC floppy-disk drive. This battery-operated drive can read from and write to 720K and 1.4-megabyte DOS floppies.

The memo function is a complete text editor, and each document is saved as a separate disk file. Untimed to-do appointments appear at the top of each day's appointment list, and the screen is wide enough to display the current month's calendar beside the daily list. The calculator function is similar to the Wizard's "printing calculator," and NumLock changes part of the keyboard into a quasi-numeric keypad.

There are three ways for Macs to exchange data with the Poqet PC. Traveling Software's LapLink Mac bundles an adapter cable with communication and data-translation software designed to copy and translate files back and forth. A Poqet PC and a Mac can also transfer data over the phone by using modems. Files copied to the Poqet PC's 3.5-inch disk drive can be transferred to any Mac with AFE (Apple File Exchange).

In spite of these options, there is no effective way to integrate the Poqet PC's daytimer functions with the Mac. Poqet offers PoqetTools on disk for the IBM PC, but there is no Mac version. There are no equivalent Mac programs that store their files in the Poqet PC's format. If you need the Poqet PC's power, you'd be better off with a laptop.

Atari Portfolio

The Atari Portfolio, available from Computer Friends, is a DOS-compatible computer with 128K of RAM, expandable to 640K or more. File Manager, a DOS shell, comes with the unit and lets you access files and daytimer functions through an on-screen menu.

In addition to the standard functions, the Portfolio has a phone-dialer function that requires holding the telephone's

Table 1: Picking the Appropriate Palmtop

	Pros	Cons	Ideal Users
Atari Portfolio 	• Spreadsheet application is included.	• Poorly designed keyboard. • No text wrap. • No Mac-software equivalent. • Peculiar scrolling calendar display.	• The Portfolio will appeal only to those who require its spreadsheet program.
Casio B.O.S.S. 9500 	• Excellent Mac software. • Business-card function is a relational database. • Multiple-criteria searches. • Smallest unit in the test group.	• Awkward commands. • Convoluted data-entry procedures. • Data In/Out button that prevents data entry unless you press it.	• Most traveling Mac users who need a Mac-compatible palmtop *now*.
Poqet PC 	• A complete DOS computer in a palmtop. • PoqetTools contains a well-implemented set of daytimer functions. • Access to most standard DOS software. • The best keyboard in the group.	• DOS interface. • No Mac version of PoqetTools. • Expensive.	• The Poqet PC is a must-have for gadget lovers. For real work, though, get a laptop computer.
Sharp Wizard OZ-8000 	• Mac-like interface, good display. • Multiple phone-book files. • You can almost touch-type on the keyboard.	• No current Mac software. • No multiple-criteria searches.	• Most traveling Mac users — once the Mac software is available.

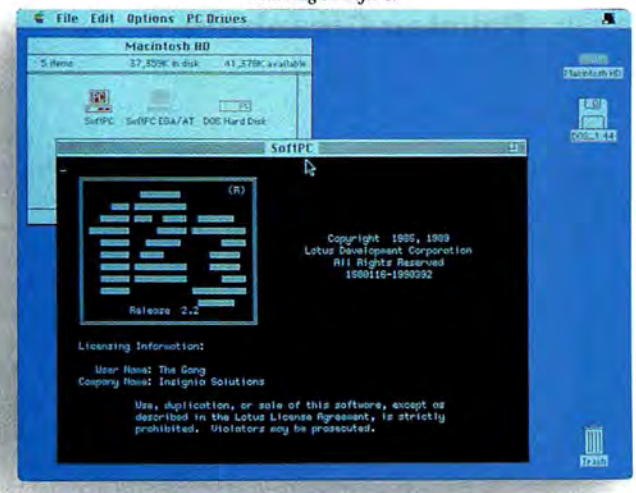
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microphone to the Portfolio's speaker. A nicely designed spreadsheet is built in to ROM. Its standard Lotus 1-2-3 file format lets you exchange files with Excel and other Mac applications that can read and write Lotus format.

The Portfolio's screen is clear and displays 8 lines of 40 characters each. In some operations — notably the included daytimer functions — it changes into a scrollable window with a view of portions of a larger 25-line-by-80-character screen. The keyboard is the worst of the tested group. Because of its stiff, tilted buttons and the raised lip that blocks the space bar, touch-typing is impossible.

You must view the calendar to get to the appointment file. The calendar, rather than being divided into months, is displayed as a scrollable list, where the last day of one month is immediately followed by the first of the next. The month names are located to the left of the first Sunday in each month.

Appointments are always displayed as a single, scrollable list, sorted by date and time. The text for each appointment occupies a single line that can continue far beyond the right edge of the screen. To read it, you must use the up or down cursor to select the entry and then the right cursor to scroll the screen — there's no text wrap. The phone book can be displayed either as a list of names and phone numbers or in index-card form with addresses.

New appointments are initially entered on the top two lines but appear in the list — sorted by date and time — when entry is complete. The Portfolio doesn't permit untimed to-do entries in the appointment file; you must save them as a memo. You can save as many appointment, phone, and memo files as memory allows, and you can also save them on Atari's plug-in RAM cards.

The Portfolio is the worst-designed unit among the palmtop organizers. Its poor keyboard and failure to wrap text to fit its screen make it a drudge for those on the go. It also suffers from the same lack of Mac compatibility as the Poqet PC. On the positive side, Atari's manual includes useful file-format information for the various daytimer functions of the Portfolio, which can help a knowledgeable user write compatible Mac programs. I'd have appreciated the same information in the Poqet PC manual.

The Bottom Line

The Atari Portfolio is a complete disappointment. It lacks the design sophistication of the other units, and its clunky keyboard and poor screen management make it virtually unusable.

I admire the Poqet PC's engineering, but I can't recommend its purchase except as a conversation piece. Those requiring the power of a PC on the road will be happier in the long run with a laptop — for about the same price.

I wanted to recommend the Sharp Wizard OZ-8000. The unit is a joy to use and has the most appropriate feature set in the group. Unfortunately, the unit's limited availability and lack of usable software prevents a recommendation. Sharp promises a completely functional Mac application by year's end. Those who can wait might love their Wizards later.

That leaves the Casio B.O.S.S. 9500 as the winner. With the excellent CasioLink software, it is the only unit that easily exchanges appointment, phone, and memo data with the Mac. Despite its problems, it's the best replacement for that déclassé Filofax.

Darryl Lewis is a South Florida Mac consultant and a frequent contributor to *MacUser*.

Directory

Casio, Inc.
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Software, $49.99 to $179.99

On MacAvenue, "Street Price" Means Great Value



We design **quality** into each one of our products and services. Then we set the MacAvenue street price so you get the best deal. And since our price always includes MacAvenue's support services and warranty, you not only get the best price, you get the best **value.**

Take a Better Look

We give you more options. Our own MacAvenue product line of hard drives, monochrome and color displays, modems and scanners gives you a value-priced alternative for Mac peripherals. For example, our hard drive is more than just another pretty case. Its metal interior and plastic exterior — designed like the Mac's — controls air flow and buffers the drive noise. When you work with the MacAvenue drive, all you hear is the sound of one hand clapping. But don't take our word for it. Ask Robert Wiggins, *MacUser*'s longtime business columnist, who gives the Protegé drive his "highest recommendation."

Protegé Hard Drives

Capacity	External		Internal	
	Seagate	Quantum	Seagate	Quantum
20+MB	$345	n/a	$295	n/a
40+MB	$395	n/a	$325	n/a
50+MB	n/a	$479	n/a	$349
80+MB	$525	n/a	$465	n/a
100+MB	n/a	$669	n/a	$539
200+MB	n/a	$979	n/a	$899

MacAvenue Announces the End of the Scroll Bar

Constant scrolling or waiting for your screen image to refresh can take the creative joy out of graphic design. So MacAvenue rescues you from the creative doldrums with a larger and sharper image of your whole design. No scrolling.

Our Protegé Display systems are value leaders in large-format Macintosh displays. Sharp screen images, flicker-free refresh rates and convenient ergonomic features such as tilt/swivel base our displays are comparable to Apple and Radius products that can cost twice as much.



The 15", ultra-high resolution screen of the Protegé features a complete 8 1/2" x 11" page with no reduction of image size or quality. Complete with video card, it's only $495. Or get a 2-page view with the 20" Protegé Dual-page Display for a mere $895. And each Protegé comes complete with screen saver and utility software — *FREE!* For a second opinion, ask Bob LeVitus, author of *Dr. Macintosh*, who says, "I love the crisp, bright image I get with a Protegé Display. And with the 30-day, no-questions-asked, money-back guarantee, you just can't go wrong. I highly recommend the Protegé Display."

Today's powerful graphics programs require a color display, and MacAvenue offers a bargain on Seiko Trinitron displays, complete with video card. Our price will make you look twice at color.

Protegé Displays

Protegé Full-page Display w/Mac II Card	*22013*	$495
Protegé Dual-page Display w/Mac II Card	*22017*	$895

Call for information about other Protegé Display options.

No Guesswork

We take the guesswork out of choosing Macintosh peripherals and software. Our engineers carefully evaluate every product to make sure it performs to exacting standards. And if you do have a question about a product, you can make a toll-free call to our technical support staff. They'll usually have you up and running smoothly in a few minutes.

We Take Care Of You

We could go on and on about MacAvenue's top-notch services. But the bottom line is that you don't have to worry about buying your system hardware and software from MacAvenue — it's guaranteed.

Three Great Reasons to Choose MacAvenue

1 30-Day Money-Back Guarantee

Every hardware product and every office accessory MacAvenue sells will give complete satisfaction. If not, return it in the original packaging within 30 days of purchase for a full refund. Consumable items, opened software, videotapes and shipping costs are not refundable.

2 Toll-Free Technical Support

If you experience a problem with anything you purchase from MacAvenue, call our product support staff at 800-766-6221 weekdays from 8:00 am to 7:00 pm, CST. We can usually resolve your technical problems over the phone.

3 Extended Limited Warranty

For up to 120 days after your purchase, MacAvenue will replace or repair (at our option and without cost to you) any product with which you are not completely satisfied. Call us for a Return Material Authorization (RMA) number. When you have the RMA number, ship the product to us, freight and insurance prepaid. We will pay the freight charges back to you (during the warranty period).

Call Today! **800-395-6221**

Key Code 870

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12303 Technology Boulevard, Austin, Texas 78727

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Overnight for $3

FEDERAL EXPRESS



On the Road with Outbound

Because it's lighter and less expensive than the Mac Portable, the **Outbound Laptop System** is the best choice for Mac users on the go. The Outbound offers 15MHz, 68000-powered performance with a sharp 640x400 pixel LCD screen and a selection of useful accessories and peripherals.

Outbound Laptop System w/ 512KE ROMs, 2MB RAM and 40MB Drive*22000* $3439
Outbound Laptop System w/ 512KE ROMs, 1MB RAM and Floppy Drive*22201* $2699

Call for more information about other Outbound accessories and options



Color Scanning Made Affordable

Scan photographs and illustrations with the **MacAvenue Color Scanner**, designed to give you precise color reproduction or a range of 256 shades in grayscale images. It also makes short work of text and line art — scanning a letter-size page in 80 seconds. Complete software includes Adobe PhotoShop.

MacAvenue Color Scanner*22768* $1739

STORAGE DEVICES

Applied Engineering		
High-Density 3.5" 1.44K Floppy Drive	*24736*	$239
Fujitsu		
800K Floppy Drive	*24731*	$99
Iomega		
Mac 1B Interface Kit	*23834*	$48
TransPortable 44MB	*24393*	$999
Kennect Technology		
Drive 2.4 (3.5")	*24730*	$328
MacAvenue		
Protegé HD Carrying Case	*26908*	$24
NEC		
CD-ROM Reader CDR-36 w/ I/F	*24636*	$499
CD-ROM Reader CDR-73 w/ I/F	*24634*	$729
Nec Bundle w/ Type Gallery	*24632*	$599
Premium Type Gallery PS w/ CDR-73	*24635*	$9995
PLI		
TurboFloppy	*24741*	$359
Quantum		
52MB LPS Internal - (IIcx,ci)	*24194*	$349
52MB LPS Internal - (SE-IIx)	*24198*	$349
105MB LPS Internal - (IIcx,ci)	*24195*	$539
105MB LPS Internal - (SE-IIx)	*24199*	$539
210MB Internal - (IIcx,ci)	*24196*	$899
210MB Internal - (SE-IIx)	*24200*	$899



Unlimited Data Storage

With a **Syquest Removable Cartridge Disk Drive**, you'll never run out of disk storage — you just add additional cartridges. Transporting large files is much easier, because the 5 1/4" 44MB cartridges can be shipped without a hitch. The Syquest offers 20ms seek time and fast transfer rates. Includes cartridge.

Cutting Edge Syquest Removable Cartridge Disk Drive.....*24401* $597

PRINTERS, SCANNERS AND FAXES

Digital Vision		
Computer Eyes Color	*22759*	$348
Epson		
ES-300C Color Scanner w/ I/F	*22765*	$1824
Kodak		
M150 Mac Portable	*22855*	$519
Relisys		
Tefax RA2110	*22700*	$895
Seiko		
Label Printer	*22852*	$184
Seikosha		
Personal Printer SL2000AP	*22857*	$235
Texas Instruments		
1MB Memory Upgrade Kit	*38563*	$259
microLaser Toner Cartidge	*38311*	$46

COMMUNICATIONS

Applied Engineering		
DataLink Express	*22306*	$169
DataLink LC	*22319*	$257
Farallon Computing		
PhoneNET Connector Din-8	*22513*	$31
Nuvotech		
Nuvolink SC	*22535*	$389
Shiva		
NetSerial X232	*22504*	$275



Global Village TelePort/FAX 9600

It's easy to send FAXes from any application's menu bar with this elegant, compact 9600 baud SendFAX and 2400 baud MNP5 data modem. TelePort connects to your Macintosh by ADB, just like your mouse, freeing your modem port and eliminating a power cord. An Eddy Award winner.

TelePort/FAX 9600*22314* $195
TelePort (modem only)*22311* $145

MONITORS AND VIDEO CARDS

Micron		
SE/30 8-Bit 640X480	*23541*	$345
Rasterops		
Grey Scale 19" monitor GS for Mac II	*22007*	$1614
RasterOps 8S	*23556*	$449
RasterOps 24S	*23557*	$729
RasterOps 8L	*23554*	$1619
RasterOps 24L	*23555*	$3179
RasterOps 264/SE30	*23539*	$685
RasterOps 24STV	*23568*	$1549

ACCELERATOR AND EXPANSION BOARDS

DayStar		
40MHz PowerCache IIci w Coprocessor	*23651*	$1167
40MHz PowerCache IIci w/o Coprocessor	*23652*	$947
Dove		
Marathon 030 Accelerator for Mac Plus	*23653*	$
Sigma Designs		
DoubleUp w/ DiskDoubler	*23656*	$
Technology Works		
IIci Cache Card w/ 64K	*23648*	$

MEMORY EXPANSION

Applied Engineering		
1MB Upgrade for MacRam Portable Card	*25488*	$
MacRam Portable Card w/ 1MB	*25487*	$
Technology Works		
Mac Portable 3MB Upgrade Kit	*25486*	$

KEYBOARDS, MICE, ETC.

Advanced Gravis		
ADB Mousestick	*25286*	
ADB SuperMouse	*25289*	
DataDesk		
Mac 101E Keyboard	*25187*	$
Mac-101 Keyboard Beige (Plus)	*25181*	$
SWITCHBOARD	*25182*	$
Kensington		
Turbo Mouse ADB	*25281*	$



Choose Daystar for Power Performanc

When you're ready for serous high-end performance — up to 50MHz speed — you need DayStar Digital's **PowerCache IIci**. Plug in this turbo-charged cache card and your IIci will be the fastest Mac alive — even faster than the IIfx.

PowerCache IIci (DayStar)
40MHz with co-processor*23651* $11
50MHz with co-processor*23649* $19



Enhanced microLaser

Texas Instruments has added 16 page-per-minute printing speed to their popular line of **microLasers**, the printer that was awarde 4½ mice from *MacUser*. The **microLaser XL** offers the same quality output as the origina microLaser and it offers added upgrade flexibility.

TI microLaser XL
35 font w/ AppleTalk*22859* $30
17 font w/ AppleTalk*22858* $27
TI microLaser
35 font w/ AppleTalk*22851* $17
17 font w/ AppleTalk*22856* $14

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FEDER EXPRE

Customer Service Is Our Most Important Product

Hand-held Scanner



ScanMan 32 is the hand-held scanner that generates 32 shades of gray in photographs, drawings, logos and illustrations. Scans a section up to four inches wide and 14 inches long. Easy installation via Mac SCSI port. 72dpi to 400dpi resolution.

ScanMan 32*22751* $319

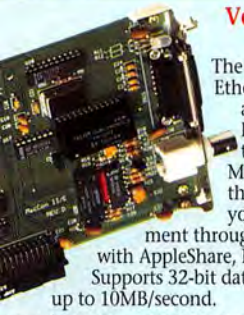
acAvenue
01 Extended Keyboard ADB*25186* $99
iko
DT3600 Digitizing Tablet.....*23734* $295

ACCESSORIES

nerican Power
JPS 110SE*26292* $207
JPS 370ci*26294* $329
rnouilli
Bernouilli Tape Cartridge B33C 44MB*57804* $95
vin Magnetics
External Tape Back-Up 5040/60*23832* $529
nsington
Mac Classic Anti-Glare Clip-on Filter*26924* $49
SE Anti-Glare Clip-on Filter (platinum)*26922* $56
SE Anti-Glare Filter (platinum).....*26883* $32
ac Cable
MacSpeaker*26923* $179
phisticated Circuits
PowerKey.....*25030* $64

SOUND INTERFACES

ticulate Systems
Voice Navigator II*23736* $649
VoiceLink*23738* $199



Versatile Network Connection

The **Asanté MacCon+** EtherNet boards are among the fastest EtherNet boards on the market. The MacCon II gives you the highest return on your network investment through full compatibility with AppleShare, NetWare and TOPS. Supports 32-bit data transfers at speeds up to 10MB/second.

Asanté MacCon+ SE/30E thk/thn*22526* $375
Asanté MacCon+ IIET thk/UTP*22529* $375
Asanté MacCon+ IIE thk/thn*22538* $375

WRITING AND PUBLISHING

Adobe
Adobe Plus Pack v1.0.....*29834* $129
Streamline v2.0.....*29269* $129
TypeAlign v1.0.4*29826* $59
TypeManager v2.0*29825* $57
Aldus
PageMaker v4.0.....*29781* $497
Personal Press v1.0*29916* $199
Broderbund Software
Typestyler v1.5*30450* $115
Claris
Claris MacWrite II v1.1*30586* $142
DeltaPoint
Taste.....*30638* $86

Add Serial Devices



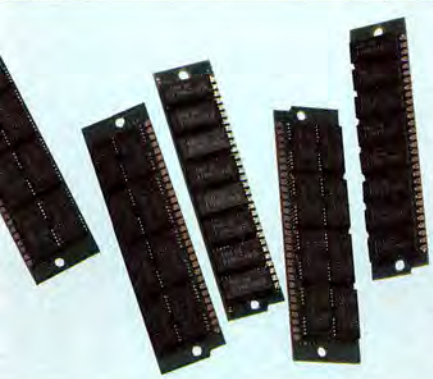
The **QuadraLink** from Applied Engineering makes quick work of Mac II system expansion by adding four serial ports to your Mac. This NuBus card is easy to install and is compatible with System 7.0. A special "shadow driver" insures compatibilty with older software.

QuadraLink (Applied Engineering).... *26917* $205

Lifetree
Correct Grammar v2.0*30633* $49
Microsoft
Microsoft Word v4.0.....*30582* $245
Reference Software
Grammatik Mac v2.0.....*30634* $50
Timeworks
Publish-It Easy! v2.0.....*29896* $145

BUSINESS SOFTWARE

Acius
4th Dimension v2.1*27780* $485
ChipSoft
Turbo Tax.....*28500* $51
Claris
Claris FileMaker Pro*27789* $216
Claris MacProject II v2.1*29740* $366
Fox Software
FoxBase + Mac v2.1.....*27791* $292
Informix
Wingz v1.1*30184* $253
Intuit
Quicken v1.5*28458* $39
MECA
Managing Your Money v4.0.....*28467* $142
Microsoft
Microsoft Excel v2.2*30180* $245
Microsoft Office Bundle.....*30182* $525
Microsoft Works v2.0.....*30581* $194
Nolo Press
WillMaker v4.0.....*29888* $37



Unforgettable Deal on Memory! — $59/Megabyte

Don't forget to maximize your Macintosh with **MacAvenue's memory bargains.** Only the best surface-mounted 80 nanosecond memory products. Call for further pricing information.

2 x 1MB SIMM Kit, 80ns*25480* $117
4 x 4MB SIMM Kit, 80ns*25481* $999
4 x 1MB SIMM Kit, 80ns*25482* $234
1MB module for Mac Classic*25493* $89
3MB module for Mac Classic*25495* $199



Too Much Fun

No matter what kind of fun you might be in the mood for, **MacAvenue's new Fun Pak II** has just what you need! Take your pick — from Apache Strike's fast-paced action to the calmer strategies of Shanghai. You'll be a winner every time! Also includes Solitaire Royale, Talking Moose and Dark Castle — more than $200 worth of software for only $49.95.

MacAvenue Fun Pak II*29410* $49.95

Reality Software
WealthBuilder v1.0*28496* $145
Softsync
Accountant Inc. Professional v2.0*28480* $345
SoftView
MacInTax 1040 Federal 1990.....*28502* $59
Software Toolworks
Dollars & Sense v5.0.....*28465* $86

Fire The Typists!



The Dest **Personal Scan** system is a hardware/software combination that automatically scans up to 10 documents, or works as a full-page hand scanner. The Personal Scan System is bundled with **Recognize!**, the OCR software that manages every job beautifully for most popular word processing and desktop publishing applications.

Personal Scan w/Recognize! (Dest)...*22762* $699

COMMUNICATIONS

I.B.S.
DataClub v1.1*27748* $199
Insignia Solutions
Soft PC AT- EGA Add-on Module.....*27716* $125
Soft PC v1.3.....*27714* $245
Sitka
MacTOPS Network Bundle*27682* $188
Technology Works
GraceLAN v1.0*27750* $219

EDUCATION AND ENTERTAINMENT

Accolade
Ishido.....*28776* $32
Addison-Wesley
Stupid Mac Tricks*28750* $19

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The Competitive Edge



Unlimited Information

You already know that CD-ROM gives you access to huge amounts of information, and now **Chinon CD-ROM** drives let you access all that information without breaking the bank. This Chinon drive is reasonably priced and will also play pure audio CDs. Complete with **Adobe's Type on Call** — a CD that includes Adobe Type Manager and two type families — **FREE!**

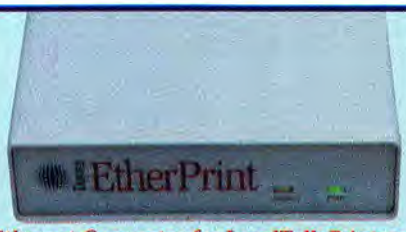
Chinon CD-ROM drive with Adobe Type on Call*24638* $569
Chinon CD-ROM drive*24397* $595

Broderbund Software
Carmen San Diego - Time*28774* $29
Carmen San Diego - World.....*28672* $29
Playroom v1.1*28770* $32
SimCity Supreme (Mac II).....*28680* $47
SimCity v1.2*28678* $29
SimEarth*28764* $45
Type! v1.0.....*27958* $18
Centron
Casino Master.....*28758* $48
Casino Master Deluxe.....*28760* $58
Davidson & Associates
Math Blaster Mystery*27970* $29
Electronic Arts
Earl Weaver Baseball*28768* $32
Pipe Dreams*28740* $17
In-Line Design
Darwin's Dilemma*27840* $31
Tesserae.....*27838* $30
MacAvenue
Better-Living Pak.....*29402* $49.95
Software Toolworks
Life & Death*28658* $32
Mavis Beacon Teaches Typing*28056* $32

Spectrum Holobyte
Faces.....*28766* $24
Falcon v2.2.....*28614* $30
Tetris.....*28606* $22
Welltris.....*28604* $25
StudyWare
ACT v1.0 w/ Cliffs Notes.....*28046* $29
SAT v1.0 w/ Cliffs Notes*28044* $29
Zondervan
MacBible-New International Version.....*28048* $72

THE GRAPHIC ARTS

Adobe
Illustrator v3.0*29789* $348
Photoshop v1.0.7*29266* $543
Aldus
Persuasion v2.0.....*29782* $327
Broderbund Software
Print Shop v1.3.1.....*29836* $35
Claris
Claris HyperCard v2.0 Dev. Kit*30578* $145
Claris MacDraw Pro v1.0*29205* $289
Electronic Arts
Studio/32 v1.0.....*29318* $445
Generic Software
Generic CADD.....*29280* $99



Ethernet Connector for LocalTalk Printers

The **EtherPrint** connector simplifies the Ethernet/LocalTalk printer connection. The Dayna Etherprint makes a simple "plug-and-print" connection fast and cost effective. Includes adaptors for any cable/printer combination.

EtherPrint (Dayna)*22541* $355

Innovative Data Design
MacDraft v2.1*29241* $275
Multi-Ad Services
ProArt Sports*29878* $95
Paracomp
Swivel 3D Professional v1.0*29294* $437

DO IT YOURSELF PROGRAMMING

Symantec
THINK C v4.0*27586* $165
THINK Pascal v3.0*27584* $166

SAFETY, MAINTENANCE, REPAIR UTILITIES

Adobe
Adobe Type On Call*30560* $49
Baseline
Thunder 7.....*30570* $58
Berkley Systems
After Dark v2.0*30425* $24



A FaxModem from Dove

The **DoveFax** gives you communications flexibility at a price that fits even the tightest budget. It combines a 9600-baud fax modem with a 2400-baud Hayes-compatible data modem and will send or receive in the background.

DoveFax.....*22701* $297

Fifth Generation
Suitcase II v1.2.3.....*30402* $
GDT
ParaLink Express*30548* $
PrintLink Collection (Serial) v4.0*30448* $
Ibis Software
Protector Shark.....*30538* $
Insight Development
MacPrint v1.2*30428* $
Microcom
911 Utilities v1.0.....*30550* $
Virex v3.0*30415* $
Now Software
Now Utilities v2.0*30498* $
On Technologies
OnLocation v1.0.....*30434* $
Power Up
Letter Writer Plus/Address Book Plus v1*29404* $
Salient
Disk Doubler v3.0.....*30546* $
Symantec
Norton Utilities v1.0*30437* $
SAM v3.0.....*30343* $
Sum II v2.0*30340* $

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My Advanced DataBase, the powerful productivity-building package from MySoftware, can jumpstart your marketing, personnel management, customer service or any other information management function. My DataBase is loaded with easy-to-use features.

My Advanced DataBase..... *27815* $34
MyMailList..... *27816* $27

At MacAvenue we are committed to giving you the affordable, reliable Macintosh products you want, *when you want them.*

Orders placed by 8:00 pm CST Monday through Thursday for in-stock items ship the same day with a $3 overnight delivery charge for orders weighing 20 lbs. or less. Saturday delivery is available for an additional charge. Minimum order of $50.

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For COD orders, add $8.

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Key Code **870**

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You've probably got dozens of questions about electronic photography. Unfortunately, there aren't dozens of places to get them answered.

If you're a professional photographer, you already know that Ken Hansen Photographic is America's most respected photo equipment dealer. If you're not, permit us this brief biography.

Fourteen years ago, Ken Hansen went into business with a different philosophy than most. He figured that concentrating on moving equipment off the shelves was a quick route to becoming just another me-too discounter. That approach not only lacks integrity, it also isn't much fun.



Canon RC-470 Hi-Band Still Video Camera

So instead, he decided to research all the manufacturers' claims through his own sampling and testing. He then narrowed his product lines down to only the very best. He reinforced his selective stock by offering clients the advice of truly expert sales people. And he created a unique support program that addressed his customer's special needs.

What our experience means to electronic photography.

Today, electronic photography has added an exciting new dimension to visual communication. The ability of electronic imaging devices of all kinds to capture, enhance and reproduce high quality visual information has made the still video camera an indispensable tool for photographers, desktop publishers, graphic designers, picture editors, realtors, fashion designers, filmmakers, plastic surgeons, dermatologists, claims adjustors, anyone else who uses photography with computers.



Nikon 35mm Film Scanner LS-3500

Unfortunately, the average computer dealer isn't trained to help you make an intelligent choice.



Sony Mavica MVC-5000 Hi-Band Still Video Camera



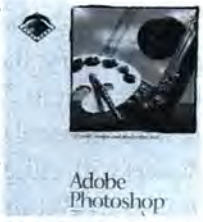
Sony Mavica MVC-2000 Hi-Band Still Video Camera

At Ken Hansen, we've brought our traditional approach to researching and testing photo equipment to still video cameras and other electronic imaging devices. Since the introduction of the very first still video cameras, we've been investigating and evaluating their capabilities. We've reviewed electronic imaging components for picture quality, ease of handling, performance characteristics and systems compatibility, and we've refined our lines to carry only the best.

And, since a still video camera is only part of an electronic imaging system, we carry the hardware and software you'll need to best utilize it. You'll find products like the Wacom pressure sensitive tablet, the Neotech image grabber, PLI storage systems, Adobe's Photoshop software and much more. All of them are tools you can trust. Because at Ken Hansen, we've tested them for you, so you don't have to learn the hard way.

What our free seminars mean to you.

The more you know the better we like it. So we conduct a free weekly seminar each Wednesday from 11AM to 1PM. We'll demonstrate all our still video cameras for you and let you experience them, hands-on. We'll show you how to integrate photography to the creative potential of Adobe's Photoshop and Quark's X-press software. And, of course, we'll detail all the applications of still video photography to your specific business.



Adobe Photoshop Image Manipulation Software



Canon FV-540 Still Video Player / Digitizer (SCSI Compatible)



Canon Xap Shot Still Video Camera

More Ken Hansen services

At Ken Hansen, we want you to feel comfortable about visiting our Apple Macintosh equipped showroom, anytime. Here, you'll get your questions answered, so you can understand what you need to know ...*before you buy*. To help you gain experience with minimum risk, we offer rentals with fees applied to purchase and lease-to-buy programs designed to fit the most modest budget.

The Electronic Imaging Department at Ken Hansen Photographic. It just doesn't make sense to buy your still video camera equipment anywhere else.



Tamron Fotovix III converts slides and negatives to video

☐ YES. I want to know more about still video and electronic photography. I'll affix this coupon to my letterhead and fax it to 212-473-0690. Rush my still video information kit and sample image disk. Ken Hansen may charge my credit card $5 to cover postage and handling.

Credit Card # _____ Exp. Date _____

Name as it appears on credit card. Please print. _____

☐ AMEX ☐ VISA ☐ M/C (Check one)

I'm particularly interested in (check one)

☐ Multi-media ☐ Image compression and storage ☐ Desktop publishing ☐ Photo retouching

MU/1

Ken Hansen Photographic Electronic Imaging Department

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HIGH-SPEED LOW-COST IIci Cache Cards

If you're lucky enough to own a Mac IIci, your luck just got even better. MacUser Labs tested eight inexpensive ways to blast your IIci to warp speed.

BY JOHN RIZZO AND THE MACUSER LABS STAFF

The Mac IIci is fast — four times as fast as a Classic or an SE. Impressive, but it's still only half as fast as the reigning champ, the IIfx. However, the IIci clobbers the IIfx in one important respect: price. You can save more than $3,000 if you settle for a Mac IIci — and for a few dollars more, you can narrow the performance gap with a simple but ingenious addition: a IIci cache card. If you own a IIci, buy a cache card. No other Mac accessory offers so much for so little.

At a cost of around only $200 or $300, a cache card can give your Mac IIci a 35-percent performance boost. Only the IIci includes a special slot ready to receive an add-in cache, a compact card laden with high-speed memory; the top-notch IIfx comes with a cache already built in. The IIci's cache slot can also be filled with an accelerator (see the "On the Horizon" sidebar) with either a fast 68030 or a new 68040 microprocessor. But these cutting-edge cards don't offer the exceptional bang-for-the-buck performance of the humble cache card — expect to pay thousands of dollars for a 68040 accelerator.



PHOTOGRAPHY: STEVE UNDERWOOD


Mac IIci
Mac Classic
MacUSER
LABS
Mac IIci
with cache card
Mac IIfx
Macintosh IIci

Figure 1: Inside the Mac IIci

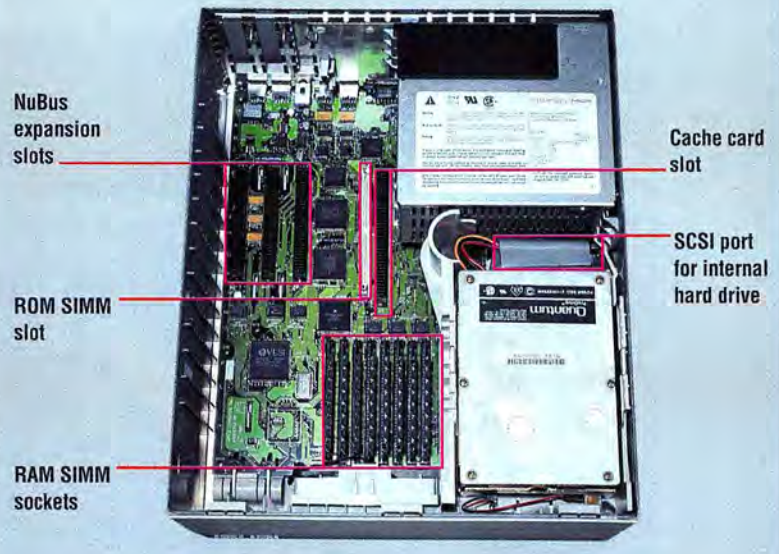


Figure 1: The Mac IIci's 120-pin cache-card slot is easily accessible. The IIci slot differs from connectors in the SE/30 and IIsi that look similar in that it is specifically designed for a memory-cache card.

We tested eight IIci cache cards and were impressed by them all. The only obvious difference among them was the amount of cache memory they contained. The Cache Card 32, from iir — pronounced "eye squared are," an electrical formula for power — and the MacCache LP32, from UR Micro, come with 32K of RAM. Three cards offer 64K: DayStar's FastCache IIci; UR Micro's MacCache 64; and the Cache Card 64, from Technology Works, which is also sold by TMS Peripherals under the same name. Two cache cards — the QuickCache IIci, from Total Systems, and the Xceed IIci, from Micron Technology — sport 128K.

We found that increased memory doesn't translate into better performance. As you'll see from our test results, using a cache card with double the memory produces only a 2-percent improvement in general IIci performance. Regardless of cache size, all eight cache cards sped up a variety of applications, including number crunching, graphics, and even word processing — and all worked without a hitch.

The only cache card we know of that can give you trouble is the now-discontinued Apple Mac IIci Cache Card, which was withdrawn in October 1990, because of a bad chip that caused the IIci to crash. At press time, Apple hadn't decided whether it was going to reintroduce the card, but there's no reason to wait for Apple to make up its mind — its Cache Card is almost identical to the ones we tested.

Cache and Memory

A cache card is simply a circuit board that contains high-speed RAM chips that serve as a *cache memory* for the Mac IIci's 25-megahertz 68030 CPU. Cache cards use *static RAM*, which is much faster than the *dynamic RAM* that *system memory* — where programs and files are loaded from disk — uses. The Macintosh isn't designed to use faster static RAM in its system memory — too bad, because the dynamic RAM in the Mac IIci accesses data in 80 nanoseconds (80 billionths of a second), whereas the static RAM used in the cache cards needs only 25 nanoseconds.

This fast static-memory cache stores frequently used data and instructions and hands them to the CPU when it requests them. If your IIci doesn't have a cache card, its slower system RAM can't keep up with the CPU's demands for information. The CPU must wait, and the Mac slows down. With a cache card installed, the IIci doesn't have to wait, because cache memory can transfer information as fast as the 68030 can handle it. A cache card doesn't *accelerate* the IIci — you can do that only by replacing its 25-megahertz 68030 microprocessor with a faster model. Instead, a cache card removes an important bottleneck to CPU performance — RAM speed — and enables the IIci to be all that it can be.

A cache card has nothing to do with the Control Panel cache, which is a *disk cache*, not a memory cache. Both work on a similar principle — speeding access to frequently used data — except that a disk cache holds information from a *disk drive*, lessening the time the Mac has to wait for a hard disk or floppy. There are no hard and fast rules for setting the Control Panel-cache size, but we've found that somewhere between 64K and 128K works best for all Macs.

Easy Installation

Installing a cache card is simple: Open the IIci's cover, and plug the card into the 120-pin cache slot located near the center of the IIci's motherboard (see Figure 1). If you should happen to have a 120-pin PDS (processor-direct slot) card designed for an SE/30 or IIsi, don't be tempted to see if it fits. It does, but there's a danger of damaging both the board and the IIci.

Before installing a IIci cache card, be sure to ground yourself to avoid discharging a zap of static electricity onto the cache card and the IIci motherboard. Computer chips are sensitive to static electricity and can be

permanently damaged by an errant discharge. Six of the cache-card vendors provide a static grounding strap to prevent you from damaging your card or your IIci during installation. (Total Systems and Micron said they would provide one on request.) UR Micro does not provide a grounding strap.

One caveat for those who have altered their IIci's hard-disk-drive mounting brackets to accommodate a 5.25-inch hard drive rather than being content with the 3.5-inch drive intended for use in the IIci: Only "half height" cache cards — which are less than 2 inches high — fit under a 5.25-inch drive. Of the boards we tested, only the 32K boards —the iir Cache Card 32 and the UR Micro MacCache LP32 — were half-height.

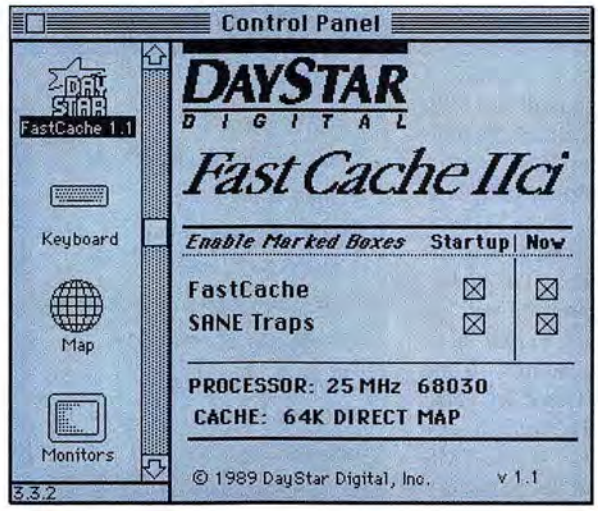


Figure 2: Most of the IIci cache cards are bundled with software cdevs that let you turn the cards on and off. The cdevs can also control SANE patches — called SANE Traps here — that enable programs that don't normally access the IIci's floating-point math coprocessor to do so.

Simple Software

A cache card is a straightforward piece of hardware — you plug it in and restart your Mac, and it goes to work. If you should ever need to turn it off, all but the iir Cache Card 32 include a simple on/off cdev — handy if something goes wrong with your system (or if you're running flaky software) and you want to eliminate the cache card as a possible source of your problem. The only way to turn off the iir card is to open your IIci and remove the card — hardly rocket science. Although we didn't have any reason to turn off any of the cards (we didn't have problems with any of them, and we used no bug-ridden software), the ability to do so easily is important — just in case.

Another piece of useful cache-card software is a SANE (standard Apple numeric environment) patch routine, which enables applications that don't normally use the Mac's floating-point math coprocessor to access it. We found only marginal, if any, improvements when using a SANE patch with the applications we used in our testing — but this doesn't rule out the patch's effectiveness on the thousands of Mac applications we didn't test. The iir Cache Card 32 and UR Micro MacCache LP32 and 64 were the only cache cards that didn't come with SANE patches. Like on/off switches, controls for SANE patches are located in cdevs.

Micron's Xceed cdev also comes

So You Don't Have a IIci?

Although Macs other than the IIci don't have dedicated cache slots, the LC, SE/30, and IIsi can still benefit from a memory cache. The IIfx comes with a memory cache already installed, and Classic or Portable performance wouldn't improve even if you could install a cache.

There's no cache card available for the Mac LC — yet. Given the great price/performance provided by a cache card and given the great acceptance of the new low-cost color Mac, it's a safe bet that a vendor will soon provide one. We also know of no cache card for the SE/30, although there's no overwhelming technical reason why one cannot be produced.

IIsi owners can choose a new cache module from PSI, Cache-It ($499). Cache-It is about the size of a SIMM and plugs into PSI's IIsi direct-slot adapter ($69), which has a socket for an optional FPU ($127) — if you need all three components, the total cost is $695. That's not as attractive as the low price of the IIci cache cards, but our tests show that Cache-It boosted the IIsi's performance past that of a stock IIci. PSI Integration, Inc., 851 E. Hamilton Avenue, Suite 200, Campbell, CA 95008; (408) 559-8544.

If you have a Macintosh Portable or Classic, however, don't bother waiting for a cache card to appear. Cache cards help performance by alleviating the slow-RAM bottleneck — the Classic and Portable are victims of their slow 68000 microprocessors, not slow RAM. To help sluggish Classic and Portable performance, you should instead investigate a microprocessor-based accelerator.

— Paul Yi



With the compact Cache-It, from PSI, and an optional FPU, a Mac IIsi is faster than a IIci without a cache card.

with Fkeys (keyboard combinations) that can turn the cache and the SANE patch on and off with a single keystroke. Micron also bundles a nifty fractal-generating benchmark program that lets you test your IIci's performance with the cache on and off (guess which way wins . . .). Total Systems bundles Micron's software with its QuickCache IIci, and DayStar bundles its own benchmark program with its FastCache IIci card (see Figure 2).

Another plus for consumers is the generous warranty offered by most cache-card vendors. The Technology Works Cache Card 64 and the TMS Peripherals Cache Card 64 both carry lifetime warranties. Micron, Total Systems, and UR Micro all offer warranties of five years — almost a lifetime for a personal computer. DayStar and iir offer three-year warranties, still longer than in most of the rest of the Mac universe.

Figure 3: Overall Performance

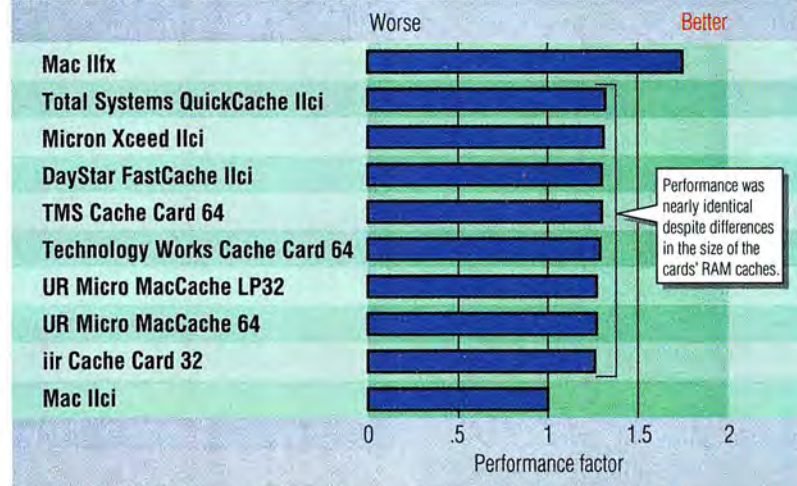


Figure 3: Our benchmark tests consisted of operations using Excel, Word, 4th Dimension, and Adobe Illustrator. The results were weighted to simulate real-world application use. All the cards boosted overall performance by about 30 percent over that of a IIci without a cache card. We found only a slight correlation between the size of the cache and the amount of improvement — the cards performed about the same.

Pick a Card, Any Card

We used a variety of real-world benchmark tests to see how much improvement the cache cards offer over a stock IIci. Our test IIci system had 4 megabytes of RAM, a Quantum 105-megabyte hard-disk drive, and a standard Apple Display Card 8•24 video card. We ran System 6.0.7 with the Control Panel cache switched off and without MultiFinder to eliminate them as variables.

The results were clear and immediate: All eight cache cards boosted overall performance of the IIci by around 30 percent (see Figure 3). There were differences among the four applications we used — a spreadsheet program, a word processor, a graphics program, and a database program — with some showing more improvement

On the Horizon

Cache cards are only the tip of the IIci-performance iceberg. Accelerators based on the Motorola 68030 that fit into the IIci cache-card slot will soon be available from DayStar Digital and Siclone Sales and Engineering. DayStar's PowerCache IIci is available in 40- and 50-megahertz versions, each with or without an optional 68882 FPU (floating-point unit) math coprocessor and a 32K RAM cache. Prices range from $1,299 for the 40-megahertz version without an FPU to $2,699 for the 50-megahertz version with an FPU. Siclone's Intensifier ci runs at 50 megahertz and is available with an FPU for $2,899 or without an FPU for $2,499. Both versions include a 64K RAM cache. DayStar Digital, 5556 Atlanta Highway, Flowery Branch, GA 30542; (800) 962-2077 or (404) 967-2077. Siclone Sales and Engineering Corp., 107 Bonaventura Drive, San Jose, CA 95134; (408) 263-8207.

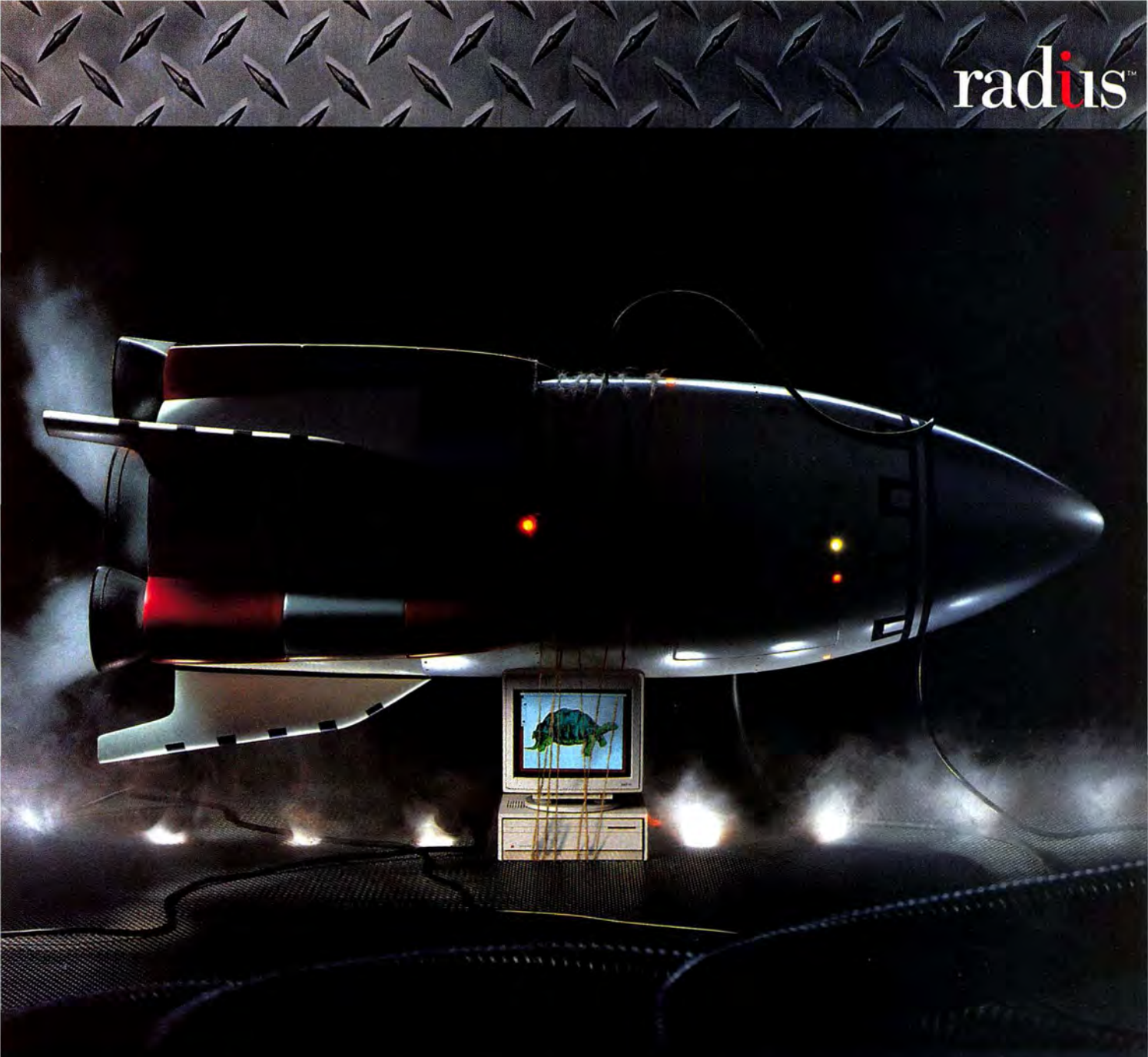
Promising even faster performance are accelerators based on the new Motorola 68040, including Fusion Data's TokaMac LC for the Macintosh LC ($2,995) and the Radius Rocket for the Mac II family (less than $4,000). Expect these boards to boost overall performance by up to four times that of a Mac IIfx. Other 68040 boards-in-progress are Total Systems Integration's Magellan 040 and iir's Performance/040 Accelerator, tentatively priced at $2,995 and $3,995, respectively. Fusion Data Systems (represented by Quantum Leap Systems), 15875 Highland Court, Solana Beach, CA 92075; (619) 481-8427. iir, 210 Dahlonegha, Cumming, GA 30130; (404) 781-8643. Radius, 1710 Fortune Drive, San Jose, CA 95131; (408) 434-1010. Total Systems Integration, Inc., 99 W. 10th, Suite 333, Eugene, OR 97401; (800) 874-2288 or (503) 345-7395.

Sigma Designs is the first vendor to introduce acceleration and compression on the same board. The Sigma Bullet 3040, which lists for $1,999, features a 32K RAM cache, a 40-megahertz Motorola 68030 processor, and a compression coprocessor from Stac Electronics. The Bullet comes bundled with software that compresses files to as little as half their original size without any data loss. Sigma Designs, 46501 Landing Parkway, Fremont, CA 94538; (415) 770-0100.

In addition to all this activity on the cutting edge of acceleration technology, vendors continue to introduce new versions of the humble but effective IIci cache card. ATTO Technology, for example, has just begun shipping the ATTO Cache ci ($259), similar in design and features to the UR Micro MacCache 64, tested in this report. ATTO Technology, Inc., 1576 Sweet Home Road, Amherst, NY 14228; (716) 688-4259.

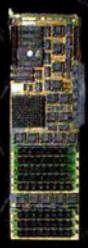
— Jeff Pittelkau

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than others, but the overall improvement was obvious (see Figure 4). The results also show that performance is almost identical among cache cards — in every test, the results varied by less than 6 percent.

We were surprised to learn that cache-memory size — 32K, 64K, or 128K — makes only a slight difference: As mentioned before, using a cache card with double the memory produced only a 2-percent speed improvement. The insignificant increase in speed is balanced by an equally trivial difference in price: The cost of 32K and 128K cache cards can vary by less than $40 at street prices.

Although a cache card always boosts a IIci's performance, the degree of improvement depends on the type of application you're running and the task you're performing. Caches work best for tasks such as number crunching that use a small amount of code in a repetitive fashion. The best performance enhancement, for example, was on a Microsoft Excel spreadsheet recalculation, with an average speed increase of about 35 percent over the speed of a IIci without a cache card installed. A Change All command in a 46-page Microsoft Word document gave a similar result, showing a 33-percent improvement. (The 80K Word document was loaded into system RAM, so there was no disk activity.) Even when you're not doing number crunching, a cache card can boost overall IIci speed, including its handling of video graphics. Previewing an Adobe Illustrator 325K EPS file showed an average improvement of 18 percent.

If you're struggling with a sluggish database, however, a cache card won't help much: We saw little improvement — less than 5 percent — when we sorted a 2,000-record 4th Dimension database. Don't blame 4th Dimension — because the number of records was too great to be loaded entirely into system memory, the test measured disk performance, not RAM response. Increasing the Control Panel disk cache would help, but the best remedy for a sluggish database is still a fast hard-disk drive (see "Moving Up to a Big, Fast Hard Drive," December '90, page 114).

Figure 4: Speed Improvement by Application

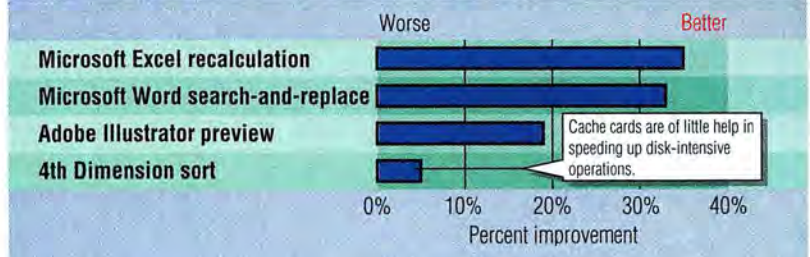


Figure 4: Performance improvements depend greatly on the type of task and the application used. A cache works best on tasks that use a small amount of code in a repetitive fashion, such as spreadsheet recalculation or word-processor search-and-replace. Disk-intensive operations such as sorting a database showed the least improvement.

Just Do It

IIci cache cards are simple, efficient, cost-effective enhancements for an already speedy Mac. Installation is easy, and all the cards we tested work without a hitch. If you own a IIci and don't have a cache card, you're cheating yourself and your Mac out of peak performance. So go call your local dealer or favorite mail-order outfit, negotiate a fair price, and then pull out your credit card — you won't regret it.

John Rizzo, *MacUser*'s technical editor, can always use a little extra cache.

The Bottom Line

A cache card is one of the most cost-effective ways to speed up your Mac — as long as you own a IIci, the only Mac fortunate enough to include a slot specifically designed for one. For around $200, you can boost your IIci's performance by 35 percent or more.

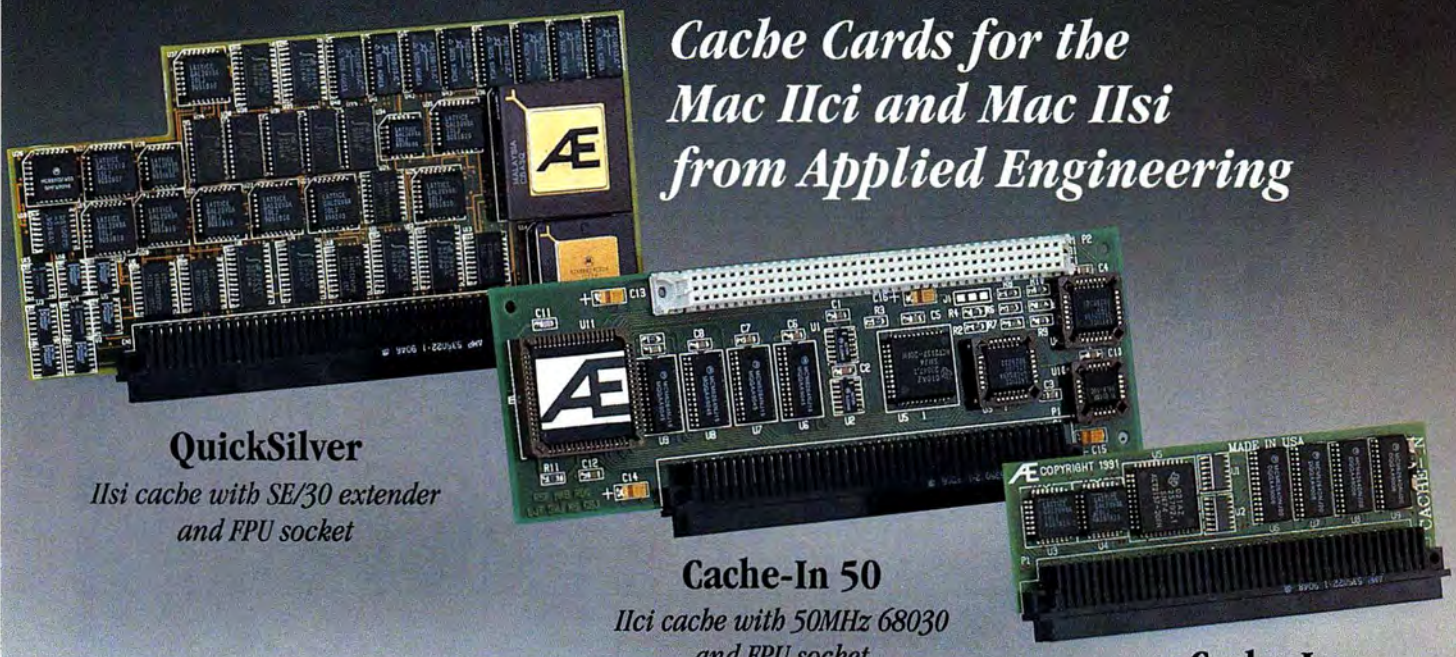
We tested eight cache cards and found that each is a cinch to install and all work flawlessly. Our performance tests revealed a virtual tie, despite differences in RAM-cache size. Cost — and to a lesser extent, software — should be the determining factor in deciding which to buy. The **UR Micro MacCache LP32**, at a thrifty $189, is an attractive buy. If you want the full range of software goodies, the **Total Systems QuickCache IIci** ($269) and **Micron Xceed IIci** ($275) may be your best bargains. But a few minutes' haggling with your dealer might result in an even better deal on one of the other cards. Bargain aggressively, and then pull out your checkbook — this is one Mac purchase you'll never regret.



All eight cards performed superbly, but the UR Micro MacCache LP32 is the best bargain and the Total Systems QuickCache IIci and Micron Xceed IIci have the best software.

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Cache-In™, our low-cost/high-performance cache, boosts IIci processing speed by up to 40%. Like the Cache-In 50, the compact Cache-In fits neatly into the IIci's cache socket and still leaves room for an internal 5.25" hard drive. Its 9 surface-mount components use very little power. Cache-In provides your IIci with a lot of performance for a little *cache*.

Applied Engineering's hardware know-how doesn't end with cache cards though. We also make a full line of internal and external data/fax modems – the DataLink family – designed specifically for the Macintosh. Applied's QuadraLink provides four extra serial ports for the Mac II series. Our 1.44Mb 3.5" external floppy drive is fully SuperDrive compatible as well as affordable. We also make memory boards for the Portable, the Classic, and the II's.

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IIci Cache Cards

Table 1: Features of Mac IIci Cache Cards

● = yes ○ = no	 DayStar FastCache IIci $$$$$	 iir Cache Card 32 $$$$½	 Micron Xceed IIci $$$$$	 Technology Works Cache Card 64 $$$$$	 TMS Cache Card 64 $$$$$
List price	$379	$325	$329	$269	$269
Street price	$269	$230	$275	$269	$269
Specifications					
Cache size	64K	32K	128K	64K	64K
Card size (height)	full	half	full	full	full
Software					
Cdev to turn card on/off	●	○	●	●	●
SANE patch	●	○	●	●	●
Other software	benchmark	none	benchmark, Fkeys	none	none
Other					
Static strap	●	●	○*	●	●
Toll-free tech support	●	○	●	●	●
Warranty	3 years	3 years	5 years	lifetime	lifetime
Money-back guarantee	30 days	15 days	30 days	30 days	30 days
Company	DayStar Digital, Inc. 5556 Atlanta Hwy. Flowery Branch, GA 30542 (800) 962-2077 (404) 967-2077	iir 210 Dahlonegha Cumming, GA 30130 (404) 781-8643	Micron Technology 2805 E. Columbia Rd. Boise, ID 83706 (800) 642-7661	Technology Works 4030 Braker Ln. W. Suite 530 Austin, TX 78759 (800) 688-7466	TMS Peripherals 23123 S.W. 58th Ave. Boca Raton, FL 33428 (800) 626-6347

● = yes ○ = no	 Total Systems QuickCache IIci $$$$$	 UR Micro MacCache 64 $$$$½	 UR Micro MacCache LP32 $$$$½
List price	$269	$199	$189
Street price	$269	$199	$189
Specifications			
Cache size	128K	64K	32K
Card size (height)	full	full	half
Software			
Cdev to turn card on/off	●	●	●
SANE patch	●	○	○
Other software	benchmark, Fkeys	none	none
Other			
Static strap	○*	○	○
Toll-free tech support	●	●	●
Warranty	5 years	5 years	5 years
Money-back guarantee	30 days	30 days	30 days
Company	Total Systems 99 W.10th Ave., Ste. 333 Eugene, OR 97401 (800) 874-2288 (503) 345-7395	UR Micro 1659 N. Forest Rd. Williamsville, NY 14221 (800) 876-4276 (716) 689-1600	UR Micro 1659 N. Forest Rd. Williamsville, NY 14221 (800) 876-4276 (716) 689-1600

*A static strap will be provided by the vendor on request.

Criteria

List price — The manufacturer's suggested retail price.

Street price — An average actual price charged by dealers around the U.S. in February 1991 or by vendors that sell only direct.

Cache size — The amount of static RAM on the card.

Card size (height) — A half-height card is less than 2 inches tall and fits under a 5.25-inch hard-disk drive. A full-height card is approximately twice as tall and fits under a 3.5-inch hard-disk drive.

Cdev to turn card on/off — A Control Panel device to enable or disable the cache card.

SANE patch — Software that enables applications that don't ordinarily take advantage of the 68882 floating-point math coprocessor to do so. SANE stands for standard Apple numeric environment.

Other software — Additional bundled utilities.

Static strap — A device you wear while installing the cache card to prevent damage to the card from a discharge of static electricity.

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Macintosh IIsi



PHOTOGRAPHY: WALT DENSON

MAC, DOS, and VAX File Servers

A smorgasbord of multiplatform file servers is now on the network menu —MacUser Labs selects the hottest performers.

BY DAVID BEAVER, TIM STANDING, AND THE MACUSER LABS STAFF

Whether you're waiting for dinner or data, nobody likes slow service. If your network is so sluggish that the floppy-disk shuffle is making a comeback and users aren't dancing for joy, maybe it's time to move up to a more powerful server.

MacUser Labs has often recommended an SE/30 and Apple's AppleShare software as our file server of choice (for example, see "NetResult: The Best File Server," June '90, Buyer's Guide page 29), but Macs share the corporate landscape with heftier hardware, such as UNIX-, VAX/VMS-, and 80386- and 80486-based file servers. With the right software, these foreign-flavored computers can serve files and data to Macs as well. And a high-performance system, such as a Digital VAX or a Compaq 386, holds the promise of better service — for a higher price — than does an SE/30 running AppleShare.

Optimizing Server Performance

You can't afford an SE/30 or a IIsi, but you still need to improve the performance of your network file server? Try eliminating some of the bottlenecks. For example, hard-disk input and output may be bogging down your server. Many other factors can cause server slowdown too — here are some cost-effective ways to put more pep into your server's step:

Check your server's memory. An AppleShare server should have no more or less than 2 megabytes of RAM. More than 2 won't hurt; it's just wasteful — our tests show that it doesn't make any difference.

Check the server's hard-disk interleave. Because SCSI is slower on earlier Macs, disks must be properly *interleaved* for best performance. Interleaving — physically laying out the sectors of data on a disk in an alternating pattern — makes a drive perform faster. But too much of a good thing can degrade performance. As a general rule, the best interleave for disks on an unaccelerated Mac Plus is 3:1; on an SE, it's 2:1; and for an SE/30 and other 68030 Macs, it's 1:1.

A shareware program such as SCSI Evaluator — available from user groups, bulletin boards, and on-line services such as Zmac — can let you know what the interleave is on your hard disk. CompuServe subscribers can access Zmac by issuing a GO ZMAC command at the ! prompt. SCSI Evaluator (SCSIEV.SIT) is in Applications Library 1 of the Download Forum.

Defragment your hard disk regularly. Over time, data becomes fragmented — scattered willy-nilly over your server's hard disk — which makes accessing that data even slower. A hard-disk utility, such as Symantec's Norton Utilities for the Macintosh, can defragment your disk and give its performance a booster shot. For safety's sake, be sure to back up the server disk before defragmenting.

Buy a big, fast hard drive. Especially under a heavy load or when transferring large files, a big, fast hard drive can make a real difference. Look for an average access time of less than 20 milliseconds. (See "Moving Up to a Big, Fast Hard Drive," December '90, page 114.)

Optimize your network design. If possible, make sure frequently used services and their clients are on the same physical cable. The more routers you must go through to get to your file server, the more things will slow down.

Divide and conquer. If your server does double (or triple) duty as a file-server/print-server/mail-server combo, it's doing too much. Running too many services on the same CPU bogs the server down. Turn one of your Mac workstations — say one of your Mac Pluses — into a second server for your E-mail and other services from which users don't demand Type A performance.

Treat yourself to a 68030 Mac. The speed of the machine can help, as our tests showed, and the faster SCSI throughput of 68030-based Macs can make better use of the fast hard drive.

— David Beaver and Kelli Wiseth

So, should you upgrade your file server to a IIfx and return the SE/30 to someone's desk, or should you link up with the engineering department's VAX? If you're lucky — or on a tight budget — maybe you can get away with simply polishing the performance of your current server (see the "Optimizing Server Performance" sidebar).

To help you decide, MacUser Labs ran eight file-server software-and-hardware configurations through a rigorous suite of tests. We ran Apple Computer's AppleShare on three different Macs — an SE/30, a IIsi, and a IIfx. We also tested software that makes non-Mac hardware look just like an AppleShare server: Novell's NetWare for Macintosh 2.0 and AT&T's StarGROUP Server for Macintosh, which despite their names, run on 80386- or 80486-based computers, not on Macs; and Alisa Systems' AlisaTalk 3.3, Pacer Software's PacerShare, and Digital Equipment's Pathworks for Macintosh, which are software packages that turn a Digital VAX into an AppleShare-like server. The 80386-based machine we used was a Compaq DeskPro 386/33L, and the VAX/VMS machine was a Digital VAXstation 3100. We put all these server configurations through a file-storage-and-retrieval extravaganza and simulated real-world activity with a 4th Dimension database. Read on for the results — but don't retire your SE/30 just yet.

AppleShare Basics

All file servers are made up of the same pieces — a computer, a hard-disk drive, and file-server software that lets network users access the hard disk — but they come in many configurations. For example, hard-drive vendor Jasmine bundles all these components into one package, the LocalLink (see the "AppleShare on an SE/30 Versus LocalLink" sidebar).

AppleShare is file-server software that runs on any Mac and works over an AppleTalk network, through cables connected either to your Mac's LocalTalk port or to an EtherTalk card or SCSI device. Apple designed AppleShare in conjunction with the System software, so the connection between a user's Mac (the *client*) and the AppleShare server is virtually seamless (see Figure 1).

This transparent communication between the AppleShare client and server is conducted according to AFP (the AppleTalk Filing Protocol). AFP enables AppleShare to control such things as file access by multiple clients — preventing two Microsoft Word users from opening the same document at the same time, for example, or locking a record in a 4th Dimension database while it's being updated (see the "How It Works: File Servers" sidebar). Up to 50 clients can simultaneously log on to the server if AppleShare is running on a Mac II, SE/30, or more powerful Mac. With a Mac Plus or SE as the server, AppleShare lets only 25 clients log on simultaneously.

A *distributed* server, such as one running TOPS, from Sitka, lets each Mac on a network act as both client and server (see the "AppleShare Versus TOPS" sidebar). With a *dedicated* server, such as one running AppleShare, the Mac acting as the server cannot also be used as a client.

However, other server processes — E-mail, print spooling, or internet routing, for example — can run in the background (see "Building a Better Network with EtherTalk-to-LocalTalk Routers," April '91, page 156).

An AppleShare server is easy to set up. The installation program runs in just a few minutes and turns any Mac with a hard drive into a file server — without any loss of data already on the hard disk. It's equally easy to administer an AppleShare server. Managing user access and maintaining security involves the familiar click-and-drag Mac interface.

AppleShare client software comes with System 6.0 and later. PC-compatibles can participate as AppleShare clients by using Farallon's PhoneNET Talk software. AppleShare server software runs only on Macs, but a Mac running AppleShare client software can access other vendors' AFP-compliant server software — even if the server software is running on a VAX or a PC-compatible — as easily as if it were AppleShare on a Mac. Users won't know the difference.

A non-Mac-based server has the advantage of giving Macs, PCs, and UNIX- and VMS-based clients access to the same files and data: The accounting department's PC users can create a Microsoft Word file on Monday morning, and marketing's Mac users can edit the same file that afternoon. If you've ever had to recreate information because the original was on an incompatible machine, you'll appreciate the easy access to the same data across different platforms that a non-Mac server can bring you.

Baby-Blue Servers

AT&T and Novell sell file-server software — StarGROUP LAN Manager Server and NetWare, respectively — that runs on 80386-based hardware servers. They also sell software — StarGROUP Server for Macintosh and NetWare for Macintosh — that turns their file servers into ones that the Mac can use for file and printing services. You install both the basic server software and the Mac-support module onto the 80386 or more powerful machine. For our tests, we used a Compaq DeskPro 386/33L with 12 megabytes of RAM and a 320-megabyte hard drive — a $15,000 desktop computer.

AT&T Computer Systems has been marketing networking hardware and software since 1985. StarGROUP LAN Manager Server is AT&T's

Figure 1: AppleShare File Access

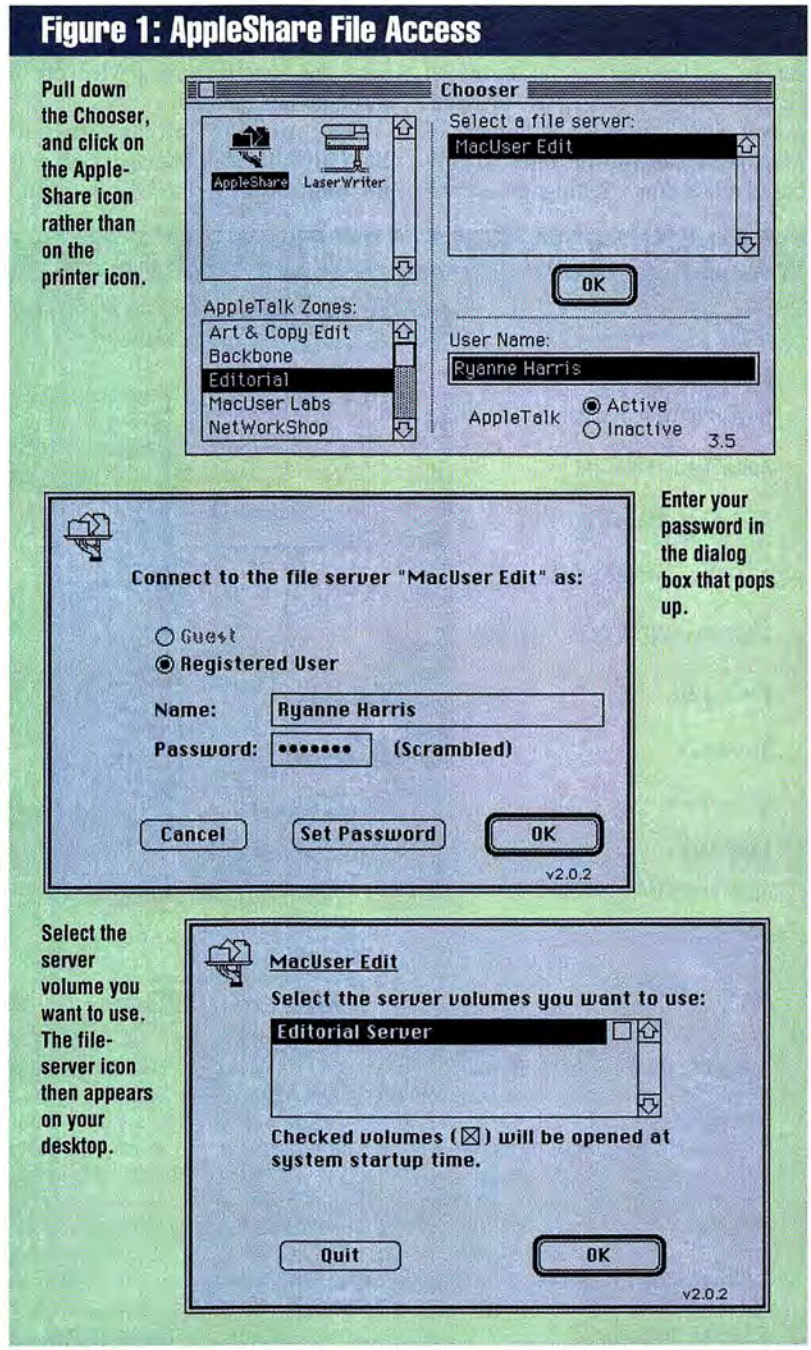


Figure 1: Server software lets network users store and share documents, folders, and applications. Logging on to AppleShare — or any AFP-compliant file server — is as simple as selecting a printer.

UNIX-based implementation of the Microsoft LAN Manager standard. The server software runs on the UNIX operating system on a 80386-based or more powerful computer and supports client access from DOS, OS/2, and UNIX workstations.

AT&T also sells high-performance server hardware, such as the StarServer E, but StarGROUP LAN Manager Server and StarGROUP Server for Macintosh can run on most 80386-based platforms. Setting the server software up on our Compaq involved installing the UNIX operating system, the network-protocol stacks, the StarGROUP LAN Manager Server software, and then the StarGROUP Server for Macintosh software — a time-consuming but simple procedure. After the installation, you simply access the server from a Mac client through the Chooser.

One of the advantages of StarGROUP LAN Manager Server is its multitasking UNIX operating system: You can run the file-server software and other processes, such as an Oracle SQL (Structured Query Language) database manager, at the same time.

Novell NetWare is a complete network operating system. It's the most popular server software in the PC-compatible world, by a wide margin, connecting more than 2 million DOS and OS/2 workstations worldwide. NetWare stores files on-disk in its own unique format, which has been highly

Figure 2: File-Server Performance

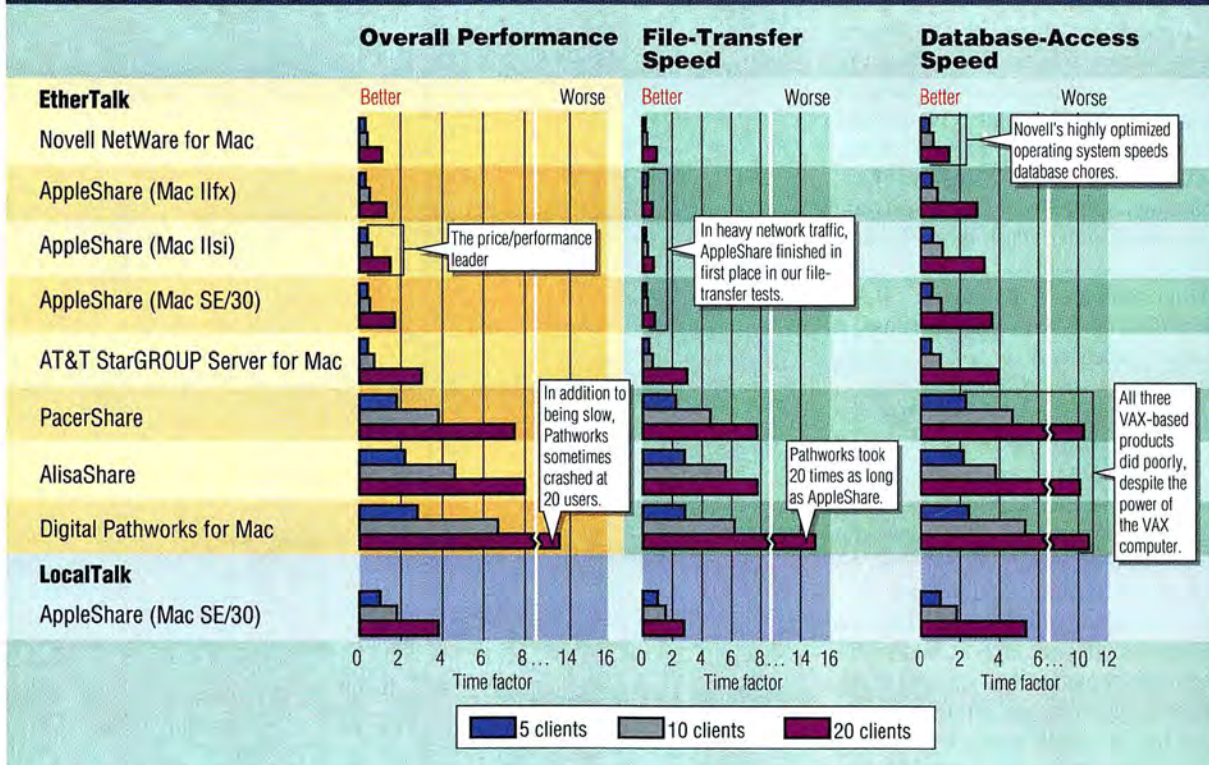


Figure 2: Over an EtherTalk network, we performed a suite of tests involving file reading and writing while bombarding each file server with requests from 5, 10, and 20 Macs. We then compared the results with those of the same tests performed on AppleShare running on an SE/30 over a LocalTalk network.

Over the EtherTalk network, we tested AppleShare running on three Macs — an SE/30, a IIsi, and a IIfx. For testing the 80386 server software — AT&T StarGROUP Server for Macintosh and Novell NetWare for Macintosh — we used a Compaq DeskPro 386/33L, and for the VAX server software, we used a Digital VAXstation 3100.

Overall Performance:

Novell NetWare for Macintosh running on the Compaq and AppleShare on a IIfx topped the field. AppleShare on the inexpensive Mac IIsi was close behind.

File-Transfer Speed:

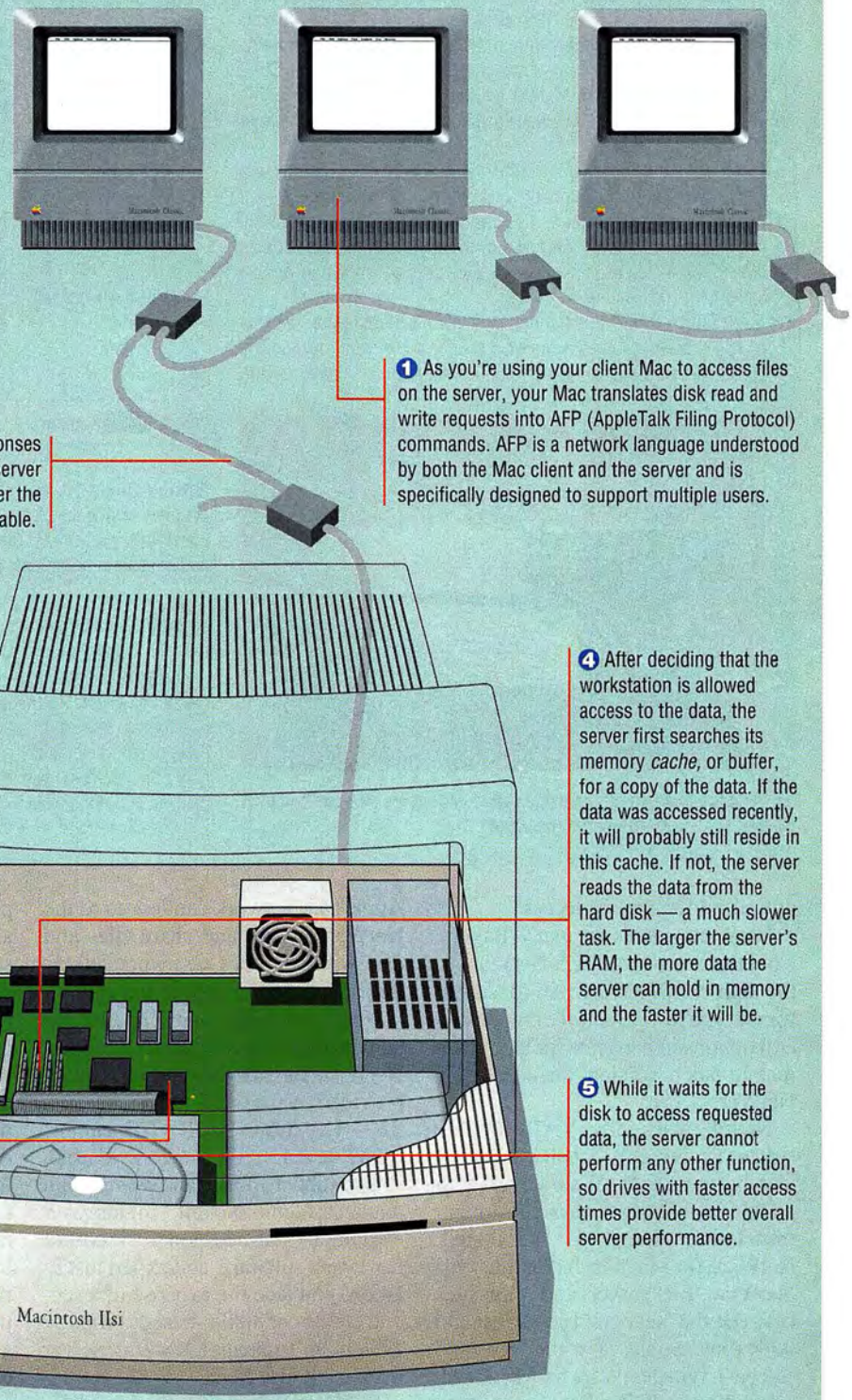
We kept the EtherTalk-network file server busy — dealing with requests from 5, 10, and 20 clients — while a single client copied a 1-megabyte folder to the server. The top four server setups were at least twice as fast at handling the traffic as was AppleShare running on an SE/30 over LocalTalk. We also read the same file *from* the server, with nearly identical results.

Database-Access Speed:

While one client searched for, changed, and summarized data in a 4D database on the EtherTalk-network server, the other clients — 5, 10, and 20 at a time — searched the 6,000-record database at random. The performance improvement over the LocalTalk network was not as dramatic as for the file-transfer tests, but at 20 users, our NetWare setup was almost twice as fast as AppleShare on a Mac IIfx.

How It Works: File Servers

File servers let multiple workstations access a hard-disk space simultaneously, yet they prevent multiple users from modifying the same file at the same time (*file locking*). Servers also let multiple users read from and write to the same database file but prevent them from writing to the same record simultaneously (*record locking*).



❶ As you're using your client Mac to access files on the server, your Mac translates disk read and write requests into AFP (AppleTalk Filing Protocol) commands. AFP is a network language understood by both the Mac client and the server and is specifically designed to support multiple users.

❷ AFP commands and responses between workstation and server are transmitted over the LocalTalk or EtherTalk cable.

❸ The server logs AFP commands in the order received, in a to-do list. Before acting on any command, the server evaluates the request: Does the workstation have permission to access the data? Is another client already using the data?

❹ After deciding that the workstation is allowed access to the data, the server first searches its memory *cache*, or buffer, for a copy of the data. If the data was accessed recently, it will probably still reside in this cache. If not, the server reads the data from the hard disk — a much slower task. The larger the server's RAM, the more data the server can hold in memory and the faster it will be.

❺ While it waits for the disk to access requested data, the server cannot perform any other function, so drives with faster access times provide better overall server performance.

AppleShare on an SE/30 Versus LocalLink

Unlike server software that requires a host computer, Jasmine's LocalLink is a complete package — a hard-drive-sized plastic case containing a Motorola 68010 processor running Jasmine's server software. Jasmine bundles the LocalLink with five different hard-drive capacities from 90 to 680 megabytes; prices range from $999 for the LocalLink 90 to $3,999 for the hefty LocalLink 680. The LocalLink also lets you daisy-chain as many as seven Jasmine hard disks to one LocalLink.

Although the LocalLink provides AFP-compliant file services to a LocalTalk network, that's all it provides — you can't set up your E-mail or print server on a LocalLink. Also, the LocalLink has only a LocalTalk connection; you can't connect directly to Ethernet. And when it comes time to retire the LocalLink, you can't use it as a workstation or as a stand-alone computer.

We ran a LocalLink/90 through the same file-storage and -retrieval and database-access tests as we did its more expensive cousins. The LocalLink was consistently only about half as fast as AppleShare on an SE/30 — and AppleShare and an SE/30 really left the LocalLink in the dust in the 20-user database-access test (see Figure A).



Jasmine bundles all the necessary components into one compact — but slow — file-server package.

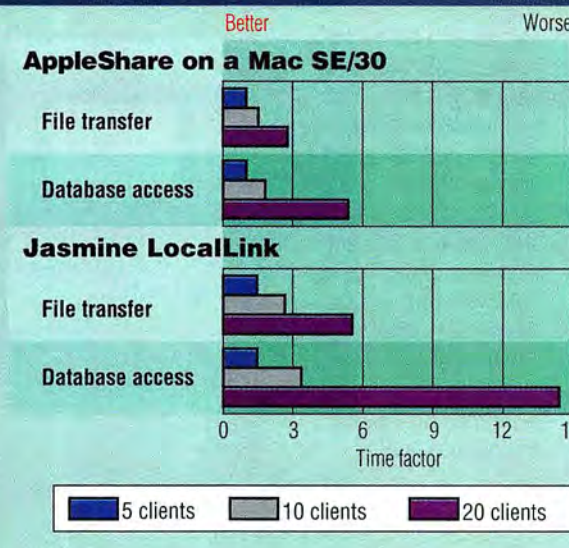


Figure A: In the 20-user database-access test, the LocalLink just couldn't keep pace. AppleShare running on an SE/30, even over LocalTalk, was almost three times as fast. The LocalLink is a satisfactory solution only for small networks.

But you get what you pay for — the LocalLink is a very inexpensive file server. With a 90-megabyte hard drive, its suggested retail price of $999 is less than half the price of a Macintosh Classic with comparable disk capacity and AppleShare software. And Jasmine ships the LocalLink with the software already installed on the hard disk, so you don't have to think about it.

— Kelli Wiseth

optimized for speedy access.

NetWare comes in many flavors, from the entry-level ELS NetWare to the high-end NetWare 386 (designed for enterprisewide service), with several options in between, including the feature-laden version we used, SFT NetWare 2.15c.

Novell also sells VAPs (Value Added Processes) — software modules that provide NetWare servers with additional features such as file-format translation. The VAP we tested, NetWare for Macintosh 2.0, runs on a NetWare file server and translates between the NetWare file format and AFP (but see the "On the Horizon" sidebar). With NetWare for Macintosh on the host machine, Mac users on an AppleTalk network can log on to the NetWare server and share files and data with DOS or OS/2 workstations that are also connected to the server.

You'll probably want experienced help in installing Novell NetWare and NetWare for Macintosh; help is ably provided by the many Novell dealers. SFT (System Fault Tolerance) NetWare 2.15c, the version we used, ships on about 30 disks and with enough manuals, admits Novell, "to start your own library." In addition to the cost of hardware, software, and expert installation, you face the expense of a second 80386- or 80486-based computer — you can't manage a NetWare server from itself or a Mac.

SFT NetWare 2.15c provides data-protection features not available with a standard Mac-based AppleShare server. System fault tolerance protects server data through various multiple-hard-disk schemes. Automatic duplication of a hard disk's data onto a second hard disk through the same data channel — *disk mirroring* — is one form of system fault tolerance. *Disk duplexing* is similar to mirroring but provides greater protection at a faster speed, because the duplication takes place through a separate channel. Such features dramatically reduce the risk of data loss due to hardware failure. Golden Triangle DiskTwin ($999), a disk-duplexing system, adds this level of protection to a Macintosh-based server.

VAX File Servers

Computers based on the 80386 aren't the only non-Mac machines that can serve as file servers for a multivendor network. Several years ago, Apple developed AppleTalk for VMS — a version of the AppleTalk network system for Digital's VAX/VMS computers — to encourage integration of AppleTalk and VAX networks. Alisa Systems then pioneered Mac-to-VAX connections in 1986 with its AppleShare-like product, AlisaShare (included in the AlisaTalk package). Alisa Systems was closely followed by Pacer Software with PacerShare. Digital's own Pathworks for Macintosh, developed in close coordination with Apple, was released in late 1990.

AlisaTalk, PacerShare, and Pathworks for Macintosh all run on top of AppleTalk for VMS on VAX/VMS computers. All three provide AFP-compatible access to VAX/VMS files from the Mac desktop through the AppleShare Chooser interface. Unlike with the DOS-based options, you get everything you need to set up the VAX as a Mac file server in one package, including AppleTalk for VMS.

You still need the hardware, however — and it's not cheap. Our test platform consisted of a VAXstation 3100 with 8 megabytes of RAM and three 100-megabyte hard drives. Bigger, faster Digital VAX models are available, as are new small models, such as the VAXstation 3100e, which Digital claims is 40 percent faster than the model we used.

AlisaTalk 3.3 consists of the AlisaShare AFP File Server, AlisaPrint, AlisaTerminal (a remote-terminal emulator), and the Alisa Digital Print System. AlisaTalk adheres to Digital as well as Apple network standards and includes support for DECnet CTERM (a communications

AppleShare Versus TOPS

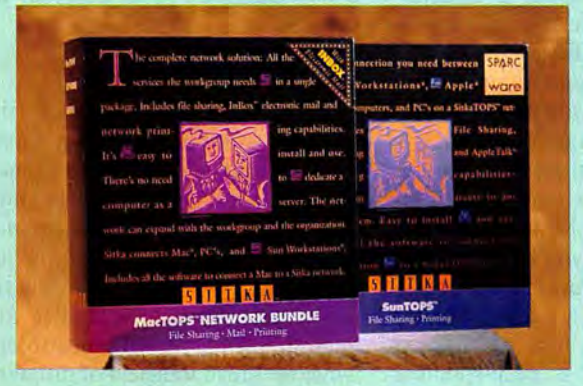
After AppleShare, Sitka's MacTOPS ($299 per user) is the most popular Mac file-server software. But unlike AppleShare, which is dedicated server software, TOPS can be used in either a dedicated or a distributed configuration. Each computer on a TOPS network can access (*mount*) the *published* folders of other TOPS clients/servers on the network. TOPS isn't AFP-compliant — it uses its own INITs and DA to provide file access. With Sitka SunTOPS ($1,295), you can use a Sun SPARCstation as a file server and let MacTOPS and DosTOPS users share files. (The DOS version of TOPS is not yet AppleTalk Phase 2-compliant, so we didn't include it in our tests.)

To be consistent with our other tests, we used TOPS in a dedicated configuration. We performed our suite of tests for MacTOPS on a IIfx, and we tested SunTOPS on a Sun SPARCstation IPC with 8 megabytes of RAM and a 320-megabyte hard-disk drive.

AppleShare on an SE/30 outperformed TOPS in all our tests. Although it was only slightly faster at the 5-user mark, AppleShare really showed TOPS up with 10 and 20 users (see Figure B).

At one time, TOPS was considered a cost-effective choice for small workgroups of, say, two to four Macs. Given System 7.0's built-in peer-to-peer file-sharing capabilities, the advantages of TOPS will no doubt diminish. If your network is a platform potpourri, however, remember that TOPS lets you share files among PC-compatible workstations, Sun workstations, and Macs.

— Kelli Wiseth



With TOPS, a Mac can be both a client and a server, and it can connect to DOS and Sun UNIX workstations.

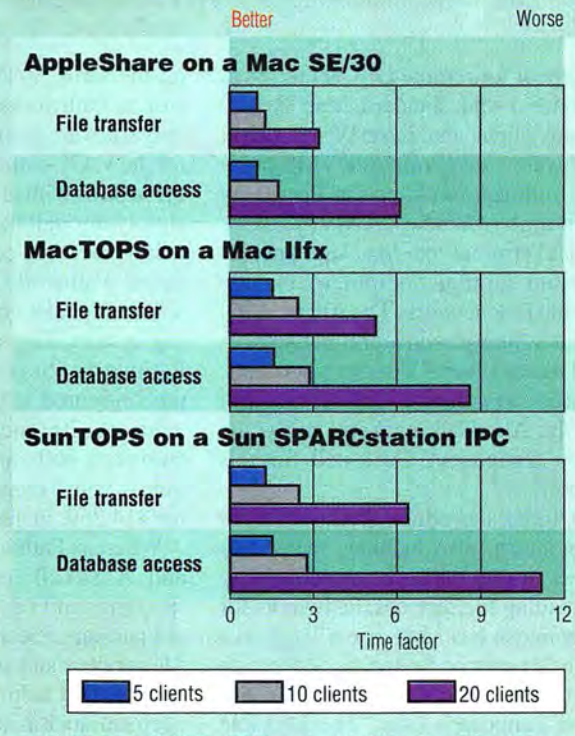


Figure B: We tested MacTOPS — in a dedicated configuration — on a IIfx, and we tested SunTOPS on a Sun SPARCstation IPC with 8 megabytes of RAM and a 320-megabyte hard-disk drive. AppleShare on an SE/30 was faster than either, especially when 20 clients were accessing the network. We performed all tests over EtherTalk.

On the Horizon

With the upcoming System 7.0, you'll get Personal AppleShare for peer-to-peer file sharing among as many as ten Macs. Look for a new, improved AppleShare, with System 7.0 support and more-flexible configuration options, in the third quarter. And expect to see the following improvements and new offerings in non-Mac products as well:

Novell NetWare for Macintosh 3.0 ($895/20-client version) is scheduled for release in April. Novell has changed the design of its Macintosh support from that of a VAP (Value Added Process) to an NLM (NetWare Loadable Module). The NLM design is more tightly integrated into the NetWare network operating system — it should be even faster. NetWare for Macintosh 3.0 requires the NetWare 3.11 network operating system. Novell, Inc., 122 E. 1700 S., Provo, UT 84606; (800) 453-1267 or (801) 429-7000.

3+Open for Macintosh 1.2 ($1,195) should also be shipping by the time you read this. This upgrade will raise the limit on the number of Mac clients that 3+Open supports — from 29 to 50 — and will support TokenTalk, print spooling, and AppleTalk Phase-1-to-Phase-2 routing. Version 1.1 owners can order a free upgrade by calling (800) 638-3266. 3Com Corp., 3165 Kifer Road, Santa Clara, CA 95052; (408) 562-6400.

The Sony NEWS File Server with uShare Plus ($5,400) is a turnkey UNIX-based file server for Mac networks. You configure and administer uShare Plus software directly from your Mac. The Sony NEWS server splits the processing tasks between two processors: One acts as the CPU, and the other handles the disk operations. Sony Microsystems Co., 651 River Oaks Parkway, San Jose, CA 95134; (408) 434-6644.

uShare Plus isn't the only file-server software that runs on a Sony NEWS server, however. Helios Software's EtherShare is a UNIX-based AFP-compliant software package that runs on a Sun or a Sony file server. EtherShare provides file service as well as print spooling for DOS-based PC-compatibles, Macs, and UNIX workstations. Like uShare Plus software, it lets you administer EtherShare from one of your Macs. Helios claims that EtherShare can handle up to 200 simultaneous clients. Helios Software GmbH, distributed by Root International Distribution Systems, 998 W. Lynn Way, Suite 4, Cupertino, CA 95014; (408) 255-2503.

— Kelli Wiseth

protocol for remote DECnet terminal services) and standard Mac AppleShare client and LaserWriter driver software. AlisaPrint uses VMS printing utilities and supports PostScript printing by Mac and VAX/VMS users. AlisaTerminal lets Mac users access remote Digital computers via the AppleTalk network. The Alisa Digital Print System provides printing services to Digital's line of PostScript printers. AlisaShare is the file-server component of the AlisaTalk package and is the only component we tested for this report.

Digital's product, Pathworks for Macintosh, also includes many features in one package. In addition to providing file services, Pathworks for Macintosh lets Macs use a VAX as a print spooler and provides Macs with a version of Apple's DAL (Data Access Language) (see "The Invisible Bridge to Mainframe Data," January '91, page 138) for use with Digital's SQL database manager, Rdb.

Digital is marketing Pathworks as a way to completely integrate a multitude of different computers. By adding other members of the Pathworks family of software to either the host or the clients (depending on the platform), Mac, DOS- and OS/2-based, and VAX-workstation clients can all store files on the same VAX computer. In the case of Pathworks for Macintosh, the only software you need to install is that for the VAX — the client Macs access the host, as with all the other products, simply through the Chooser.

If you're not confident enough to install Pathworks for Macintosh in VMS, Digital's not-so-simple operating system, Digital can sell you the Pathworks Server 3100e, a fully preconfigured VAX with server software. A 209-megabyte system — hardware, software, and documentation — with 8 megabytes of RAM lists for $14,260, including installation.

Whereas Pathworks for Macintosh and AlisaTalk provide file, print-spooling, and other such services in one package, PacerShare provides only file services and some administration features that help with network management, such as an automatic logging facility that keeps track of server use by client. If you want terminal-emulation, virtual-disk, or print-spooling services, you'll need to buy PacerLink. PacerPost lets the VAX/VMS function as a mail server for Mac, DOS-based, and VMS-based clients. PacerPrint is print-spooling software that lets Mac and VAX/VMS users share networked PostScript-compatible printers. Although these add-on modules entail extra expense, owners of the basic product get a 40-percent discount.

As you've probably gathered by now, installing server software on non-Mac platforms is a quantum leap from, say, installing fonts in your System file. For the most part, the non-Mac servers make you appreciate just how easy the Mac is to use. AppleShare installation was painless, and our external hard drive worked as expected on every different Mac. The non-Mac servers were quite a bit more complex and made us address many more issues, such as compatibility with network boards, software drivers, and hard-drive interfaces. Was it worth the struggle?

Performance Surprises

We timed each server configuration's speed of file and multiuser-database access — two key aspects of file-server use in business environments. Our test network consisted of 21 Mac clients logged on to the test server platform. We kept each file server busy by bombarding it with requests from 5, 10, and then 20 Macs, while we timed transfers of different-sized files between one Mac and the server.

Our database-access tests likewise

simulated increasing and varying demands on the server. While one Macintosh searched for, changed, and summarized data in the server's 4th Dimension database, the other Macs — 5, 10, and then 20 at a time — searched the 6,000-record database at random.

We conducted all tests over an EtherTalk network and compared the results with those of AppleShare running on an SE/30 and using a LocalTalk network.

When we began testing, we expected our stock AppleShare-and-Mac SE/30 server on the EtherTalk network to come out at the bottom of the heap. After all, it seemed reasonable to think that a VAX or 80386-based machine — coupled with complex software from companies specializing in file servers — would run rings around AppleShare on a lowly SE/30.

We were wrong. On the midrange equipment we used in our testing, the sophisticated architecture of the VAX didn't help the AFP-compliant file-server software packages. An SE/30 server running good old AppleShare over LocalTalk was about twice as fast as any of the VAX servers — even though the VAX servers were on an EtherTalk network (see Figure 2). Novell SFT NetWare 2.15c and the NetWare for Macintosh VAP running on our Compaq machine and AppleShare running on a Mac IIfx were overall the fastest server setups tested. For 20 clients, AppleShare on a Mac IIfx was the winner in the file-transfer tests, and it was only slightly behind our Novell NetWare setup in all the database-access tests. In general, AppleShare fared fairly predictably on the different Mac platforms: The 40-megahertz IIfx was faster than the 20-megahertz IIsi, and the IIsi was faster than the 16-megahertz SE/30.

As the load increased from 5 to 10 to 20 users, the differences among products became even more pronounced. AppleShare handled the increased load smoothly — the 20-client traffic tests took about four times as long as the 5-client traffic tests. With the exception of those running Novell NetWare, the other servers bogged down quickly under the increased load.

The Grass Isn't Greener

File servers add convenience and efficiency to a network. Unfortunately, as more and more people use a server, performance suffers — and so do the users. AppleShare running on a Mac SE/30 with a fast hard drive has long been MacUser Labs' server suggestion, but we hoped that some of the high-powered, non-Mac server products on the market could provide better performance. However, with the exception

The Bottom Line

MacUser Labs has long recommended an SE/30 with a fast hard-disk drive as the most cost-effective file server for Mac networks. After testing eight server setups — including some running on powerful Digital VAX and 80386-based hardware — we've changed our minds. But not much.

If you want a fast server at a great price, get Apple's **AppleShare** software ($799) and a Mac IIsi ($3,769). The IIsi offers performance that's roughly 10 percent better than that of the SE/30, at about the same cost. If money is no object, buy the fastest hard drive you can find and hook it up to a Mac IIfx ($8,969 without a hard drive). For file sharing, AppleShare on a IIfx led the pack for 20 clients, and it was second only to our Novell NetWare setup in all our database-access tests.

If you need excellent security features while you share files with DOS or OS/2 clients and want solid Mac performance — especially for database purposes — consider Novell's **NetWare for Macintosh** ($200). Novell SFT NetWare 2.15c ($4,995), the parent application we used, provides disk mirroring, battery backup, and other fault-tolerant data-security features. Novell NetWare is more complicated to set up and administer than is AppleShare on a Mac, and NetWare servers aren't generally used in an all-Mac environment. But you should seriously consider NetWare if you're looking for performance at any cost.

None of the other server software we tested can give you the performance of AppleShare or NetWare, but you may need the features it offers. AT&T's **StarGROUP Server for Macintosh** ($795/eight clients), for example, although not a speed demon in our tests, lets your Mac share files and data with DOS, OS/2, and UNIX workstations.

Despite its poor performance in AFP file sharing, a VAX file server provides a common platform on which Mac users, VAX-workstation users, and often DOS and OS/2 users can share files. If your company has some VAX horsepower to spare, perhaps this is a good way to start integrating your platforms. Pacer's **PacerShare** ($2,100/ten clients) and Alisa's **AlisaTalk 3.3** ($1,500/ten clients) were slightly faster than Digital's **Pathworks for Macintosh** ($295/client), and AlisaTalk and Pathworks bring you features besides mere file sharing: print spooling and terminal emulation, for example.



AppleShare is our price/performance choice, although Novell NetWare for Macintosh narrowly edges it as the overall speed leader.

of the Novell NetWare setup — SFT NetWare with the NetWare for Macintosh VAP — the non-Mac servers did not have breathtaking performance on our EtherTalk network. AppleShare on Apple's high-end Mac IIfx proved the fastest for file-transfer operations in heavy traffic. The Mac IIfx does not require you to use any hardware you are not already familiar with, and as faster Macs become available, you can upgrade to a faster server with ease.

Our test results also overwhelmingly prove something we've known

Table 1: Features of File Servers

● = yes ○ = no	 **Alisa** **AlisaTalk 3.3** $$$	 **Apple** **AppleShare** $$$$	 **AT&T** **StarGROUP Server for Macintosh** $$$½
Price/clients supported	$1,500/10; $4,700/unlimited	$799/50	$795/8; $1,295/unlimited
Pros	Provides many features for VAX, DOS, Mac interoperability.	Second-fastest overall. Easiest to set up and administer.	Provides file sharing for Mac, DOS, and UNIX clients.
Cons	Slow for AFP file sharing. Requires knowledge of VMS.	No support for VAX clients.	Slow for AFP file sharing. Cannot administer from Mac.
Hardware	Digital VAX	Mac	80386-based
Additional software			
Required	none	none	StarGROUP LAN Manager Server
Included	AlisaShare, AlisaPrint, AlisaTerminal, Alisa Digital Print System	none	none
Price	NA	NA	$1,995/8 clients; $3,795/unlimited
Features			
Max. no. of simultaneous users	unlimited	50	120
Set up from Mac	○	●	○
Administer from Mac	○	●	○
LocalTalk connection	○	●	○
Ethernet support	●	●	●
AppleShare client software	●	●	●
AppleShare-PC support	●	●	○
Additional-client support	DOS, VMS	none	DOS, UNIX
Company	Alisa Systems, Inc. 221 E. Walnut St., Ste. 175 Pasadena, CA 91101 (818) 792-9474	Apple Computer, Inc. 20525 Mariani Ave. Cupertino, CA 95014 (408) 996-1010	AT&T Computer Systems 1776 On The Green Morristown, NJ 07960 (800) 247-1212



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all along — an EtherTalk network can serve you much better than LocalTalk. No matter what Macintosh you're using as a server, EtherTalk is about five times as fast as LocalTalk for file access and about twice as fast for database access. But the best news of all is that you don't have to shell out a lot to get good server service — a Macintosh IIsi is nearly as fast as a IIfx and costs less than half as much.

David Beaver is president of The Automation Group in San Francisco. Tim Standing is the chief engineer at Eureka Design, also of San Francisco.

Table 1: Features of File Servers, continued

● = yes ○ = no	 **Digital** **Pathworks for Macintosh** $$$	 **Jasmine** **LocalLink** $$½	 **Novell** **NetWare for Macintosh 2.0** $$$$
Price/clients supported	$295/1	$999 to $3,999*	$200/unlimited
Pros	Self-installing Mac software for extensive VAX connectivity.	Least expensive. Includes computer and hard drive.	Fastest overall. Many data-security features.
Cons	Slow for AFP file sharing. Crashed at 20 clients.	Very slow. No Ethernet port. Must use Jasmine hard drive.	SFT version requires second 80x86 machine for administration.
Hardware	Digital VAX	NA	80386-based
Additional software			
Required	none	none	SFT NetWare 2.15c†
Included	Mail for Macintosh, MacTerminal 3.0, MacX	none	none
Price	NA	NA	$4,995
Features			
Max. no. of simultaneous users	unlimited	50	100
Set up from Mac	○	●	○
Administer from Mac	○	●	limited
LocalTalk connection	○	●	●
Ethernet support	●	○	●
AppleShare client software	●	●	●
AppleShare-PC support	●	●	●
Additional-client support	DOS,§ VMS	none	DOS, OS/2
Company	Digital Equipment Corp. P.O. Box 9501 Merrimack, NH 03054 (800) 344-4825	Jasmine Technologies, Inc. 1225 Elko Dr. Sunnyvale, CA 94089 (800) 347-3228	Novell, Inc. 122 E. 1700 S. Provo, UT 84606 (800) 453-1267 (801) 429-7000

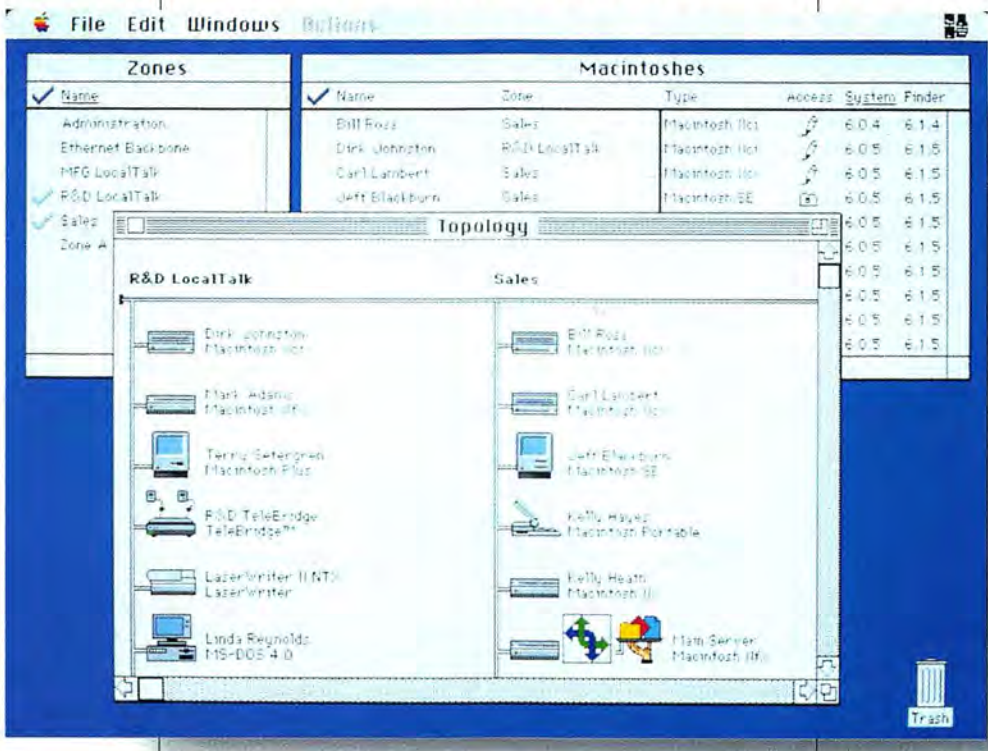
*LocalLink 90, $999; LocalLink 120/130, $1,499; LocalLink 180/200, $1,999; LocalLink 340, $2,799; LocalLink 680, $3,999.

†NetWare for Macintosh 2.0 also works with ELS II NetWare 2.15c, $1,895, and Advanced NetWare 286 2.15c, $3,295.

§DOS clients need Pathworks for DOS, $195 license.

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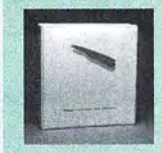
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Table 1: Features of File Servers, continued

● = yes ○ = no	 **Pacer** **PacerShare** ŧŧŧ½	 **Sitka** **MacTOPS** ŧŧ½	 **Sitka** **SunTOPS** ŧŧŧ
Price/clients supported	$2,100/10; $3,750/20	$299/1, no site license	$1,295/1 (Sun)
Pros	Fastest of the VAX file servers.	Supports file sharing among Mac, DOS, and Sun workstations.	Provides Sun-to-Mac connectivity.
Cons	Extra functionality comes at a high price.	Slow. Expensive on large network. Not AFP-compliant.	Slow.
Hardware	Digital VAX	Mac	Sun SPARCstation
Additional software			
Required	none	none	none
Included	none	none	none
Price	NA	NA	NA
Features			
Max. no. of simultaneous users	500	unlimited	unlimited
Set up from Mac	○	●	○
Administer from Mac	○	●	○
LocalTalk connection	○	●	○
Ethernet support	●	●	●
AppleShare client software	●	○	○
AppleShare-PC support	●	○	○
Additional-client support	DOS, VMS, TCP/IP	SunTOPS, DosTOPS	MacTOPS, DosTOPS
Company	Pacer Software 1900 W. Park Dr., Ste. 280 Westborough, MA 01581 (508) 898-3300	Sitka 950 Marina Village Pkwy. Alameda, CA 94501 (800) 445-8677	Sitka 950 Marina Village Pkwy. Alameda, CA 94501 (800) 445-8677

Criteria

Price/clients supported — Much server software is priced according to the number of users.

Hardware—The type of computer on which MacUser Labs installed the server software.

Additional software required—Additional software that the Mac module of the server software requires in order to run.

Additional software included — Some server software includes additional software for print spooling and mail services, for example.

Max. no. of simultaneous users —The number of logged-on clients the software supports.

Set up from Mac — Can you install the server software from a Mac?

Administer from Mac — Can you administer the server from a Mac?

LocalTalk connection — Does the server support direct connection from a LocalTalk cable, or do you need to buy a router?

Ethernet support — Does the server support direct connection from an EtherTalk cable without the presence of a router?

AppleShare client software — Is the AppleShare client software (installed with the Mac System software) used to access the server?

AppleShare-PC support — If you have PC-compatibles using AppleShare-PC (PhoneNET Talk), does the server software support these clients?

Additional-client support—Will your Macs be able to share files on the server with other kinds of computers?

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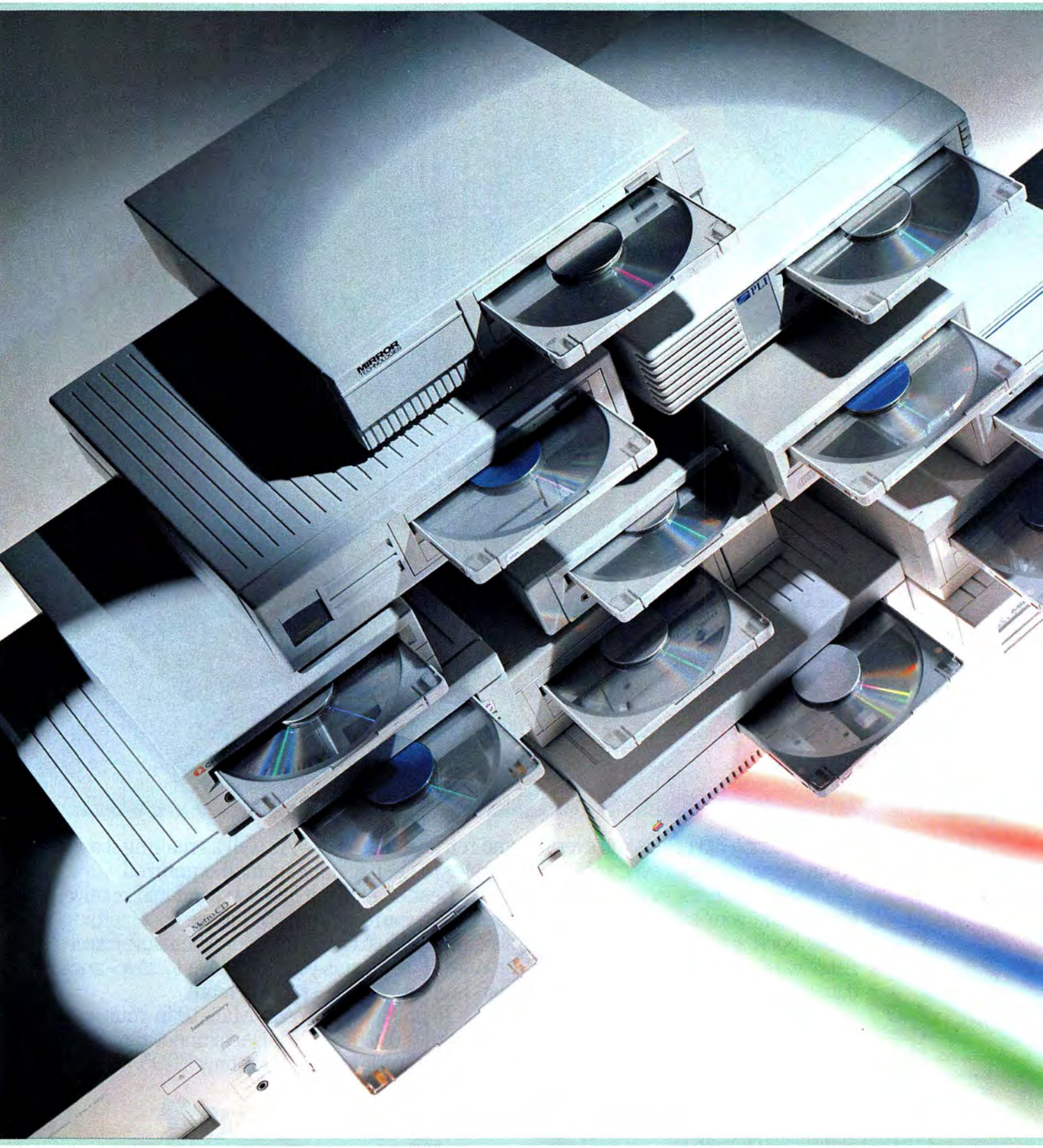
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IS IT TIME FOR CD-ROM?

All the signs say that the CD-ROM breakthrough is finally underway. MacUser Labs tests 16 drives that'll put you in the front lines of the information revolution.

Is CD-ROM a promising technology? No question. Will it ever realize its potential? Good question. The personal-computer revolution promised us high-powered computers on every desktop and instant access to vast amounts of information. The power part seems to be working out just fine, but we're still waiting for all that easily accessible data.

CD-ROM technology was supposed to be the answer. Pop a CD-ROM — the data-carrying sibling of the familiar audio CD — into a CD-ROM drive, click on the icon that appears on your desktop, and have immediate access to an enormous amount of information. More than 700 megabytes of software, images, animation, and digitized sound can be crammed onto one light, inexpensive, durable 4.75-inch disc. That's 300,000 pages of text, the name and phone number of every American, or a multivolume encyclopedia complete with full-color illustrations — an avalanche of data that would take a month to download from an on-line service.

BY RIK MYSLEWSKI AND THE MACUSER LABS STAFF



Figure 1: Most CD-ROM drives use a simple, industry-standard caddy (bottom). Optical Access International's CM 231, although less expensive, requires a Philips-designed caddy (right) that is difficult to load. The Pioneer/Relax six-disc jukebox caddy (left) is familiar to users of Pioneer's audio CD equipment.

With all this storage capacity to recommend this technology, why isn't a CD-ROM drive attached to every Mac? Last year, MacUser Labs asked the same question and tested the six CD-ROM drives then available on the Mac market (see "Most Valuable Players," March '90, page 150). We discovered that drives were steadily getting faster and less expensive, and we predicted that a plethora of attractive, useful CD-ROMs would appear that would make owning a CD-ROM drive worthwhile.

Unfortunately, last year's rumblings on the horizon have not become the downpour we predicted. Brilliantly conceived, artfully produced, inexpensive CD-ROMs are being released — but only slowly. This year we tested 16 CD-ROM drives, but the cloudburst of CD-ROM software has yet to come. Although more than 10,000 CD-ROM drives have been sold in the past year, we must still ask: What's the future of CD-ROM technology, and why isn't it here yet?

Ready, Set, Slow

Part of the answer can be found by deciphering the name *CD-ROM*, which stands for "compact disc — *read-only* memory." Unlike a hard *disk* (magnetic), a CD-ROM *disc* (optical) is not used for personal data storage. You can't write anything onto a CD-ROM, nor can you change what's imprinted on it. A CD-ROM is like a book: You buy it and you read it — you don't change it.

Still, we all buy books as well as notepads — why aren't we all buying CD-ROM discs as well as magnetic disks? It can't be because CD technology is unproven: There are 30,000,000 audio-CD players in the U.S. alone but only 300,000 CD-ROM drives throughout the world — and only around 30,000 of those are attached to Macs.

Another part of the reason why CD-ROM acceptance has been so slow is that CD-ROM drives are so slow. Audio-CD technology is more than adequate for great-sounding music but is painfully sluggish when compared with even a poorly performing hard-disk drive. CD-ROM manufacturers benefit from piggybacking audio-CD technology and manufacturing techniques, but the drives pay a significant performance penalty.

And speed won't improve. CD-ROM technology is a locked technology, frozen by aging standards. By defining such elements as disc capacity and data-transfer rate, the Sony/Philips Red Book, developed in the late '70s, defined the performance limits of audio CDs. The Yellow Book upgrade, which appeared in the early '80s, extended these limits to CD-ROM. Any manufacturer can choose to ignore these standards and create a faster optical-disc system that holds more data. The new technology might be better, but it won't be CD-ROM. It's risky business to establish a new standard — especially when the existing one is well accepted and full of promise.

Discs Get Personal

Although hundreds of CD-ROM titles are available, the majority are designed for use with PCs rather than with Macs (see the "Into the Blue" sidebar). The Mac side is growing steadily, however, with around 180 titles now available. General-interest CD-ROMs have appeared that offer everything from enormous shareware collections to the complete works of Shakespeare and all the Sherlock Holmes stories, from a multimedia presentation on the birds of the world to schlocky R-rated titillation. Graphic aids abound, including clip art, photos scanned in 24-bit color, and fonts galore. The first monthly CD-ROM "multimedia magazine," *Nautilus*, appeared in August 1990. Animated entertainments and explorations of

great musical works get better and better, and compression schemes powerful enough to enable CD-ROM distribution of video are just around the corner.

Although all these offerings are attractive, this year's most interesting — and potentially most important for the acceptance of CD-ROM technology — developments are the rapidly expanding *vertical* market for special-interest CD-ROMs and the increasing ease and economy of creating your own discs. Apple has led the way with a series of discs aimed at developers — A Disc Called Wanda, Gorillas in the Disc, Night of the Living Disc, and so on — which include massive amounts of utility software as well as multilingual editions of every version of Mac System software.

Mastering, or creating, a CD-ROM, once a complex, week-long process, can now be done in a day at minimal expense. What's more, the emergence of *write-once* CD-ROM technology has made it possible to cut your own CD-ROM, right on your desktop (see the "Desktop CD-ROM Mastering" sidebar); more write-once drives are scheduled to appear shortly.

As CD-ROM mastering becomes easier and less expensive and as write-once CD-ROM drives drop in price, the advantages to corporations will be enormous. Companies as diverse as Compaq and Mack Truck have discovered the tremendous savings in distributing manuals, training materials, and corporate databases on CD-ROM — one CD-ROM represents a ton and a half of paper, which costs more than $4,000 to mail. Count the number of offices your company maintains and multiply by how often you must update their sales and reference materials or how frequently they are visited by trainers who might easily be replaced by multimedia presentations, and you'll see why the new, simple CD-ROM-mastering techniques are so attractive — and why the U.S. government has just ordered 225,000 CD-ROM drives from Sony.

More Competition

As mentioned earlier, manufacturers of CD-ROM drives are scrambling to meet the needs of emerging vertical markets as well as to provide faster, less expensive, more versatile drives for general use. Of the 16 drives we tested this year, only the venerable AppleCD SC and the Toshiba XM3201A return unchanged from last year — except for the elimination of the AppleCD SC's dust-inducing fan. Last year's winner, the CD Technology Porta-Drive, also returns — but with new features that address most of the concerns we raised in our previous lab report. Three drives that we reported to be "on the horizon" last year — the Procom MCD 650, the Optical Access International CM 231, and the

Into the Blue

You've just unwrapped your long-awaited CD-ROM drive and plugged it in to your Mac. Unfortunately, you quickly discover that your drive can't use most of the discs in your office. You shouldn't be too surprised, because the majority of CD-ROM titles on the market are made for IBM PC-compatibles. Fortunately, there are ways to trick those recalcitrant CD-ROMs into thinking that your Mac is a PC.

First you need to mount the PC CD-ROM onto your Mac's desktop. Most CD-ROMs follow industry formatting standards, so your Mac should recognize a PC CD-ROM with no problem. And if your Mac tells you that the PC CD-ROM is not a Mac disk and asks you to initialize it, don't worry. (You can't initialize a read-only disc anyway.) It probably means that your System Folder is missing one or more of the access files that came with your CD-ROM drive: ISO 9660 File Access, High Sierra File Access, and Foreign File Access. Be sure all three are in your System Folder, reboot, and try again.

The simplest method of accessing data on a PC CD-ROM is to use a file translator such as DataViz's MacLinkPlus or Traveling Software's LapLink Mac. It's a good idea to first copy any files you want to translate onto a hard disk. The familiar old click-and-drag method works just fine.

File translation is OK for a simple data file, but if you need to run the CD-ROM's application software — such as a database engine for searching through the hundreds of megabytes of data on the CD-ROM — you'll need to run DOS on your Mac. You can do this with Insignia Software's SoftPC, a DOS emulator that runs on Macintoshes with 2.5 megabytes or more of RAM. SoftPC puts DOS into a Macintosh window in which you can run DOS software. It uses part of your hard disk as the DOS C drive and your floppy drive as the A drive. Your Mac's CD-ROM drive becomes the E drive.

To use SoftPC with your Mac CD-ROM drive, insert a PC CD-ROM into the CD-ROM drive and wait until its icon appears on the desktop. Next, launch the SoftPC application and wait for the DOS screen to appear. Go to the PC Drives pull-down menu, and select the E: Mac Files command. In the dialog box that follows, click on the Drive button until the name of your CD-ROM appears and then click on OK.

You can now run DOS software, using the CD-ROM drive as drive E. If the search engine is not on the CD-ROM disc itself, you'll have to install the appropriate DOS retrieval software on one of the other DOS drives.

Although this procedure works for most PC CD-ROMs, there are a few that can't be used with SoftPC. For instance, discs that use nonstandard, proprietary formats, such as the one on the MedLine CD-ROM, cannot be mounted on the Mac desktop and are therefore not available through the E drive. In addition, SoftPC can't use PC CD-ROMs that require Microsoft's CD-ROM Extensions or those that need to control the CD-ROM hardware, because there is no CD-ROM controller hardware for the Extensions to find. Fortunately, these impervious PC CD-ROMs are in the minority and are becoming more so every day.

A different approach, Orange Micro's Orange386, is a hardware DOS emulator that fits in a NuBus slot. Although it is quite a bit faster (and more expensive) than SoftPC, at press time, it was not able to access a Mac CD-ROM drive. It *is* possible to connect a DOS CD-ROM drive directly to the Orange386, but you can't use it to read Mac CD-ROMs.

— John Rizzo

Figure 2: Performance of CD-ROM Drives

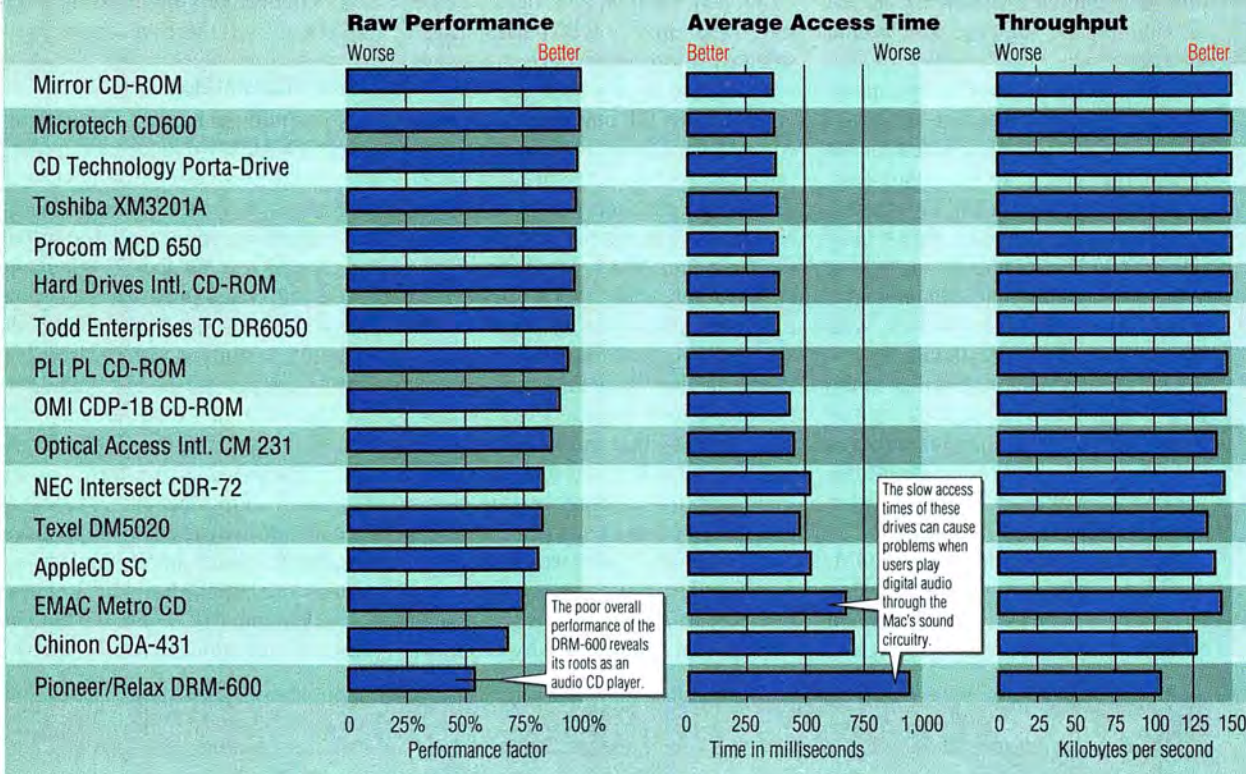


Figure 2: We ran each CD-ROM drive through a trio of tests. First, we used the FWB-Benchmark test set in the FWB Hard Disk Tools Kit to find each drive's average access time and throughput. We then timed how long it took Adobe Photoshop to open a large scanned image. Finally, we played the opening music from the Cosmic Osmo CD-ROM to hear if slow access time affected the playing of sound through the Mac's audio circuitry; only two drives — the EMAC Metro CD and the Pioneer/Relax DRM-600 — sputtered briefly during this test.

Raw Performance:

We calculated each CD-ROM drive's raw-performance rating by combining the results of the average-access-time and throughput tests. The six Toshiba-based drives led the pack, followed by Todd Enterprises' Hitachi-based TC DR6050 and the two drives with the new Sony CDU-541 mechanism. All CD-ROM drives, however, are very slow compared with any hard-disk drive.

Average Access Time:

Fast access time is important for CD-ROM databases and encyclopedias, which must conduct multiple searches across the entire disc. Our average-access-time tests show how long it takes each drive to get to the data it's searching for. The six Toshiba-based drives all turned in times of much less than 400 milliseconds — faster than the rest but still far short of a fast hard drive's average access time of less than 20 milliseconds. The Pioneer/Relax DRM-600 took nearly a full second to find its way.

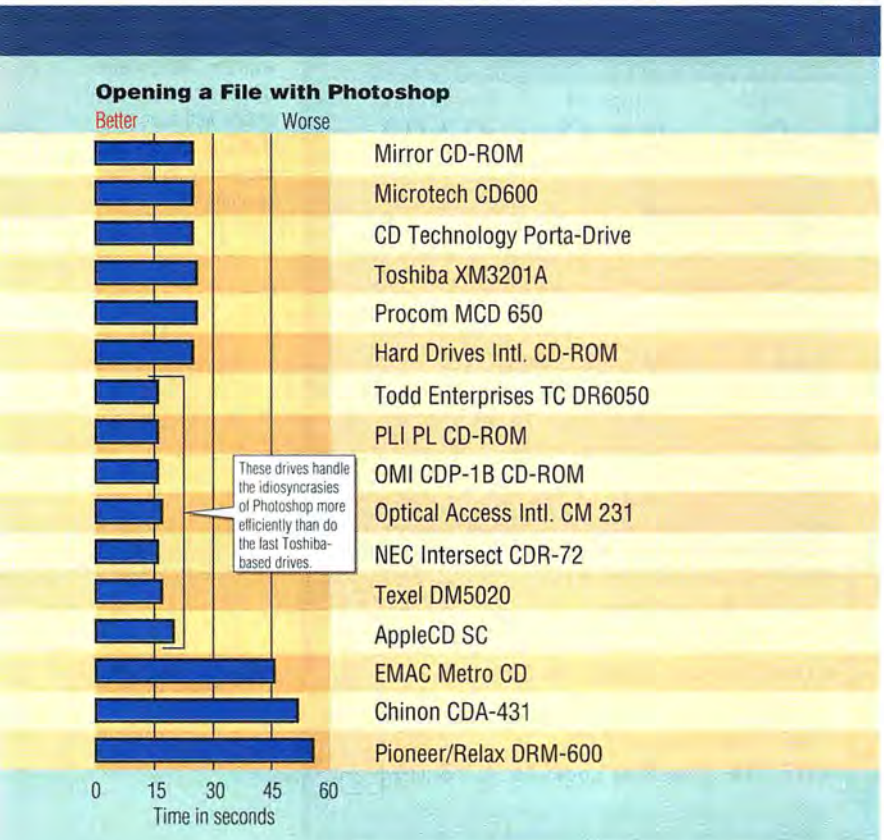
Throughput:

If you plan to download large files from a CD-ROM to your hard drive, fast throughput

Pioneer/Relax DRM-600 (a drive with a six-disc jukebox caddy) — join the veterans. Ten new drives round out the field: the Chinon CDA-431, EMAC Metro CD, Hard Drives International CD-ROM, Microtech CD600, Mirror CD-ROM, NEC Intersect CDR-72, OMI CDP-1B CD-ROM, PLI PL CD-ROM, Texel DM5020, and Todd Enterprises TC DR6050.

All Macintosh CD-ROM drives are SCSI devices and benefit from the convenience and speed of SCSI while suffering from its quirkiness (see "A Beginner's Guide to Daisy Chains," August '90, page 243). All are as easy to install as any SCSI device — simply hook them up, set the SCSI ID and termination, and drop the driver software and access files into your System Folder, and you're off and running. Our technicians congratulate Chinon and PLI for their simple termination switches. Hard Drives International, NEC, and Toshiba bury their SCSI-ID switches deep inside the back panel, making access difficult. Todd Enterprises and Pioneer/Relax retreat one step further from ease of use by forcing you to open the case to set the SCSI ID on the TC DR6050 and to remove the preset termination on the DRM-600, respectively.

Two of the drives — the CD Technology Porta-Drive and Chinon CDA-431 — use external power supplies, or



is important. However, the rigid Sony/Philips standard that defines CD-ROM technology limits throughput, or sustained data-transfer rate, to a maximum of 153.6K per second — sluggish compared with a fast hard drive's throughput of about 1 megabyte per second but speedier than a floppy drive's 56K per second. Most drives came close to the theoretical limit, except — again — for the Pioneer/Relax DRM-600.

Opening a File with Photoshop: Because CD-ROMs are quite often used to distribute scanned photographs and because Adobe Photoshop is the premier photo-retouching application for the Mac, we used this popular program to open a 1.6-megabyte 24-bit-color photo on Discimagery's Professional Photography Collection CD-ROM. Surprisingly, the six Toshiba-based drives that led in every other test were outclassed by seven otherwise slower drives. We also don't recommend three non-Toshiba-based drives — the EMAC Metro CD, Chinon CDA-431, or Pioneer/Relax DRM-600 — if you need access to photos stored on CD-ROMs.

bricks. Although external supplies keep the drive compact and cool, the Porta-Drive's power switch is inconveniently located only on its large brick, necessitating a trip to the floor each time you want to turn it off. The Todd Enterprises TC DR6050 and OMI CDP-1B CD-ROM manage to remain compact without using a brick, but the DR6050's power cord is permanently attached — a nuisance when you're transporting the drive.

The Mirror CD-ROM adds a convenient AC outlet on its back panel — a rare feature we wish were mandatory on all Mac peripherals. The EMAC Metro CD adds a curious feature called SCSI Sentry, a fuse circuit that EMAC claims protects all devices on your SCSI chain from electric-current overload — a noble goal, but in all our years of testing at MacUser Labs, we've never seen a peripheral damaged in that way.

After we installed and powered up the drives, we inserted a CD-ROM into each. For all but two, this was a simple matter of placing the disc into an industry-standard caddy (included with each drive; around $12 each for extra ones) and then sliding the caddy into the drive. It's not nearly as easy to load the delicate Philips caddy required by the Optical Access International CM 231 (two supplied, extras for around $7). The Pioneer/Relax DRM-600 uses a six-disc jukebox caddy that's easy to load — and the slight additional care required is well worth the convenience of having six discs on-line simultaneously (see Figure 1).

Speed Isn't Everything

To find out how slow these CD-ROM drives were, we ran each drive through the FWB-Benchmark test set in the FWB Hard Disk Tools Kit (see Figure 2). We wanted to ascertain how quickly each drive's optical head could get to the data it wanted (*average access time*) and, once it got there, how quickly the data could be sent back to the Mac (*throughput*). Our tests revealed that the fastest drive, the Mirror CD-ROM, took nearly 20 times as long to access data as does a fast hard drive, which can find what it's looking for in less than 20 milliseconds (thousandths of a second). Our slowest drive, the Pioneer/Relax DRM-600, averaged nearly one full second to look for data — and that didn't include the time required to search through the jukebox caddy and insert the correct disc.

Nearly all the drives achieved throughput rates close to the limit of 153.6K per second set by the Sony/Philips Red Book standard. The six drives based on the Toshiba XM mechanism were especially speedy (relatively speaking), all with throughput rates of 151K per second. Only the Pioneer/Relax DRM-600 fell significantly off the pace, pumping out data at a little more than 100K per second.

Averaging the results of the access-time and throughput tests, we obtained

raw-performance ratings that showed the Toshiba-based drives to be the speediest. Among all the drives, however — with the exception of the EMAC, Chinon, and Pioneer/Relax units — performance differences were so small as to be hardly perceptible in daily use. When choosing a drive, remember that features, software, company reputation, and service are more important than minor differences in speed. The EMAC Metro CD, for example, impressed us with its quality of construction, excellent audio software, and generous features — even though it was, overall, merely 75 percent as fast as our performance leader, the Mirror CD-ROM.



Figure 3: The Metro CD Audio DA, bundled with the EMAC Metro CD, can conveniently create and save play lists and can shrink to show only its digital readout.

Versatility Counts

How you plan to use your CD-ROM drive should also guide your choice. For example, you might frequently use Adobe Photoshop to access scanned images from a CD-ROM collection. Photoshop has a unique way of reading files, so we tested how quickly each drive could use it to open a large, 24-bit scanned image from the Professional Photography Collection CD-ROM, from Discimagery. The six fast Toshiba-based CD-ROM drives were not as successful in dealing with Photoshop's peculiarities as were the drives from NEC, OMI, Optical Access International, PLI, Texel, Todd Enterprises, and even Apple. So if you plan to do a lot of work with Photoshop, we recommend that you give up a bit of raw performance for this specialized ability to open its file format.

If sound or multimedia applications are important to you, be aware that CD-ROM drives can play audio in two entirely different ways — as standard CD audio through the drive's circuitry or as Macintosh sound through the Mac's sound circuitry. The former approach generally yields higher-quality results, but you can't do it at the same time as you're accessing nonaudio data on the disc. The latter approach usually means lower-quality sound, but you can do it simultaneously with other data access — if your drive is fast enough. Drives that weren't fast enough in our tests were the Pioneer/Relax DRM-600 and the EMAC Metro CD. Surprisingly, another slow drive — the Chinon

Desktop CD-ROM Mastering

All aspects of computing seem headed in the same direction: toward the desktop. Desktop publishing gave the Mac its foothold in the business world, desktop video is about to revolutionize presentation technology, and desktop mastering may be the key to universal acceptance of CD-ROM technology.

Mastering, the process of creating a CD-ROM, has been — until recently — an expensive and time-consuming chore entrusted solely to service bureaus and publishing houses. MacCD, from Meridian Data of Scotts Valley, California, combines Sony's new *write-once* CD-ROM technology with sophisticated software to bring mastering to the desktop. With MacCD, you can create, organize, and test a multimedia disc, or any other type of corporate electronic-publishing application, and then cut your own CD-ROMs, one at a time.

At $34,995, MacCD isn't cheap (although Meridian includes Authorware's Professional Working Model and Paracomp's Swivel 3D and FilmMaker in the price) — but breakthrough technology seldom is. However, expect the price of desktop mastering systems to come down — way down — as new write-once CD-ROM drives appear and as competing vendors such as Optical Media International and others combine them with Mac-based mastering software. Fujitsu and Yamaha currently offer write-once CD-ROM drives; JVC and Mitsumi have demonstrated working prototypes; and Pioneer, Nippon Columbia, and Tandy are rumored to have systems under development.

CDA-431 — had no trouble at all with audio.

If you're planning to play audio CDs on your drive, we recommend that you select a drive with RCA preamp outlets — without them, your audio access is limited to the headphone jack. The otherwise excellent Microtech CD600 lost points for its lack of adequate audio outlets and — like the rest of the Toshiba-based drives — for its limited four-position volume switch. A good volume control is a must for audio use. Because CD-ROM drives can double as audio-CD players, providing you with entertainment while you're not using them for data, the lack of adequate audio control is a real drawback.

Audio software, another important feature, is another area in which the sluggish EMAC Metro CD really shines. Its Metro CD Audio DA is a versatile, attractive way to control audio CDs, letting you name tracks and create custom play lists, for example. Apple's CD Remote, Chinon's CD Control, and Optical Access International's Access CD are also powerful DAs. Microtech's somewhat limited Microtraxx DA is scheduled for an imminent upgrade (see the "On the Horizon" sidebar). Microtech, along with CD Technology, Hard Drives International, OMI, Procom, and Toshiba, also offers the audio-control HyperCard stack playCD. Although versatile and able to work in the background, this stack suffers from the memory greed of HyperCard as well as from erratic performance. We found the simple Music Box DA offered by Mirror, NEC, Pioneer/Relax, PLI, Texel, and Todd Enterprises to be adequate but to have no special distinguishing features.

Are We There Yet?

CD-ROM is the technology that cried wolf. We've heard about its coming success so many times that we can't help but be suspicious when yet another article claims that the day when a CD-ROM drive is on every desk is right around the corner.

So we won't make such claims. We will, however, point out that the past

On the Horizon

If the number of new CD-ROM drives about to be released is any indication of the future of CD-ROM technology, it's going to be a banner year. A quick survey of the industry revealed a dozen new drives waiting in the wings.

NEC has come out with a new portable CD-ROM drive, the CDR-36, which replaces its painfully slow CDR-35. Although CD-ROM drives are not known for their speed, the old CDR-35 had a horrendous 1,500-millisecond access time — NEC claims that the new CDR-36 has a 500-millisecond access time. The CDR-36 ($698) weighs 2.2 pounds and is powered by an AC adapter or by an optional rechargeable battery ($99). There's no need for a battery recharger, as the unit recharges automatically when plugged into the AC adapter.

If speed is more important to you than portability, you might be interested in NEC's CDR-73, a stand-alone unit with a claimed access time of 300 milliseconds. Both the CDR-36 and the CDR-73 ($999) have two-year warranties and should be shipping by the time this article reaches the newsstands. NEC Technologies USA, 1255 Michael Drive, Wood Dale, IL 60191; (800) 366-3632 or (708) 860-9500.

Hitachi is introducing the CDR-1750 ($895; interface kit, $99.95), which has a respectable 340-millisecond access time, achieved by a newly designed motor. The CDR-1750 is heavy on features that ensure reliability: an airtight chassis, a patented Hitachi double-door mechanism to eliminate any problems with dust, and an automatic lens-cleaning feature that activates upon ejection of the CD-ROM. Hitachi Sales Corp. of America, 401 W. Artesia Blvd., Compton, CA 90220; (800) 369-0422.

The new Liberty Systems Liberty CD ($899) uses a Sony mechanism and weighs only 2.5 pounds. In a bold fashion statement, the Liberty CD, as well as the high-end Liberty hard-disk drives, will now come only in black. Liberty Systems, 122 Saratoga Avenue, Suite 16, Santa Clara, CA 95051; (408) 983-1127.

CMS Enhancements will soon ship the Platinum CD ($1,199), which has an access time of 350 milliseconds, a 64K buffer to improve performance, and sophisticated audio software. CMS Enhancements, 2722 Michelson Drive, Irvine, CA 92715; (714) 222-6000.

Also about to ship is the LK-MC501S ($849), from Panasonic. This stand-alone CD-ROM drive with optional Mac interface kit ($160) has an access time of 500 milliseconds. Panasonic Communications & Systems, 2 Panasonic Way, Secaucus, NJ 07094; (800) 742-8086 or (201) 348-7000.

Available soon will be two CD-ROM drives — one with a Toshiba mechanism ($549) and one with a Chinon mechanism ($499) — from Relax Technology. Relax Technology, 3101 Whipple Road, Union City, CA 94587; (800) 848-1313 or (415) 471-6112.

MacProducts USA will soon ship its new Magic CD-ROM, which will be available with either a Toshiba mechanism ($749) or a Chinon mechanism (around $500). MacProducts is also investigating the Pioneer six-disc jukebox caddy. MacProducts USA, 8033 Mopac Expressway, Suite 218, Austin, TX 78759; (800) 622-3475 or (512) 343-9441.

TMS Peripherals will release a CD-ROM drive in mid-1991. This zero-footprint unit will use a Toshiba mechanism; the price is yet to be set. TMS Peripherals, 23123 S.W. 58th Avenue, Boca Raton, FL 33028; (800) 626-6347.

Omnishore Electronics, formerly First Class Peripherals, is also due to ship a zero-footprint CD-ROM drive by mid-1991. Omnishore Electronics, 1700 Forrest Way, Carson City, NV 89706; (800) 982-3232.

Not all the new developments are in hardware. Microtech will soon ship a more powerful version of its Microtraxx audio software. With Microtraxx 2.0, you will be able to precisely control audio cuing and synchronize sound effects with video events. MicroTraxx 2.0 will be fully compatible with System 7.0 and A/UX. Microtech International, Inc., 158 Commerce Street, East Haven, CT 06512; (800) 626-4276 or (203) 468-6223.

As we went to press, both Toshiba and NEC announced significant new drives for $895 each. Toshiba's XM 3300 claims faster access times and has a sealed design and improved volume control; Chinon's CDC-431 has a hand-held remote-control unit.

— Darryl Chan

The Bottom Line

For years CD-ROM evangelists have promised an information-access revolution featuring low-cost, durable discs capable of providing titanic amounts of information at the click of a mouse button. Although this golden age is still a gleam in some CD-ROM publishers' eyes, progress is being made. General-interest CD-ROM titles are improving, vertical-market CD-ROM use is increasing, and CD-ROM drives are becoming cheaper and more feature-laden. As overall performance improves — although it's ultimately restricted by the limitations inherent in CD-ROM technology — features, software, company reputation, and service become more important than minor differences in speed. If speed does matter to you, it's worth noting that drives with Toshiba XM mechanisms were the fastest overall performers.

The perfect CD-ROM drive doesn't yet exist. However, we recommend both the **Mirror CD-ROM** ($697 direct) and the **PLI PL CD-ROM** ($1,099 list, $849 street) while you're waiting for perfection to materialize. The Mirror CD-ROM's lack of an adequate volume control can be a problem and neither unit provides the best audio software, but their excellent performance, solid construction, and convenient features outweigh these shortcomings.

It's a shame that the **EMAC Metro CD** ($799 list, $699 street) performed near the bottom of the heap — it offers more features and better audio software than any faster drive. If the folks at EMAC would replace the Metro CD's slow Sanyo mechanism with a faster one, they'd have a real winner on their hands.



Both the Mirror CD-ROM (center) and the PLI PL CD-ROM (left) offer a strong balance of features and power. The EMAC Metro CD (right) has a near-perfect set of features but is hampered by slow performance.

year has seen a 50-percent increase in the number of CD-ROM drives attached to Macs, the release of many attractive general-interest CD-ROMs, and the emergence of write-once desktop mastering systems. Government and industry — including Apple — have made major commitments to CD-ROM technology. We have also witnessed an explosion in the multimedia market, a flurry of activity among CD-ROM-drive manufacturers, the introduction of the first CD-ROM multimedia magazine, and drive prices steadily moving down to the magic $500 mark.

CD-ROM drives aren't yet an indispensable peripheral — and only their most ardent evangelists claim they ever will be. But they're currently the only affordable way to achieve the second half of the personal-computer promise — convenient access to vast amounts of information.

Rik Myslewski is a *MacUser* senior editor who owns more CD-ROMs than audio CDs.

Criteria

List price — The manufacturer's suggested retail price.
Street price — The actual price charged by dealers (February 1991) or by a vendor that sells only direct.
Mechanism — The name of the manufacturer of the CD-ROM drive inside the vendor's case.
Driver — The name of the company that authored the software that controls the CD-ROM drive's interaction with the Mac.
CD-ROM — The name of the CD-ROM discs bundled with the drive, if any.
Audio software — The name of the bundled software for controlling audio CDs. Usually a DA.
Audio-software type — The type — DA or HyperCard stack — of the audio software.
Connectors (number, type) — The number of SCSI connectors on each drive and the number of pins on each connector.
Termination — Whether the drive's SCSI termination is inside the case, outside the case and via a termination block, or switched.
SCSI-ID selector — How you change the SCSI-ID number.
Volume control — The type of mechanism that controls an audio CD's volume.
Headphone output — The type of headphone jack included.
Preamp output — Does the drive include two RCA jacks as a preamp output?
Internal speaker — Is there a speaker in the case?
Internal/external — The location of the power supply — in the case or in an external brick.
Power switch — The location of the drive's power switch.
Optional battery — Can the drive be powered by an optional battery pack?
Auto-switching — Can the drive automatically switch between American and European voltages?
AC fuse — Does the drive's power circuit have a fuse?
Fan — Does the drive have a fan (which can cause dust contamination problems)?
Indicator lights — The functions the LEDs indicate.
Metal/plastic — The main construction material used for the case.

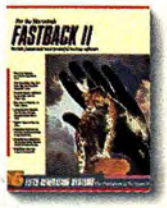
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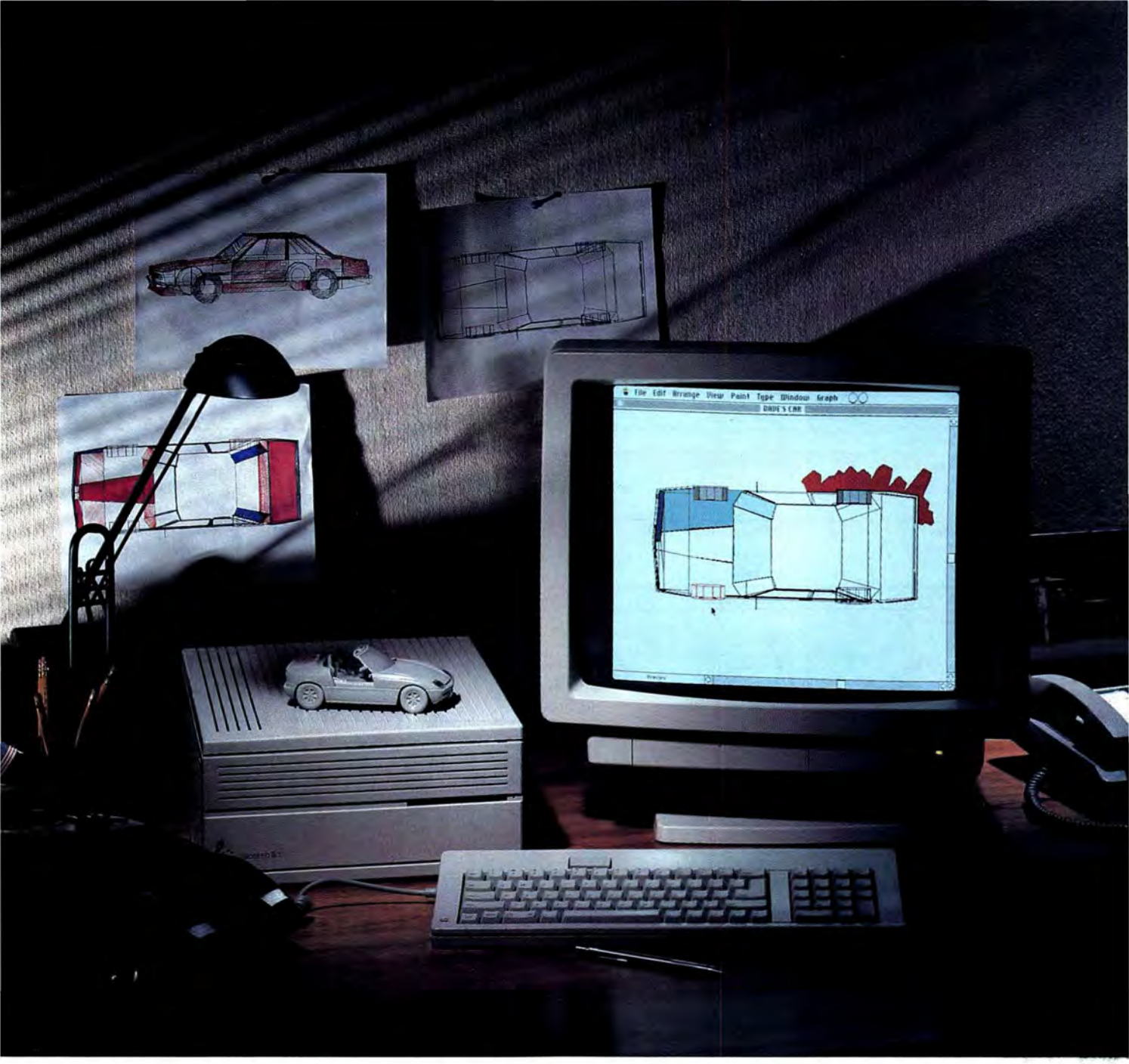
Some People Never Learn
In your December '90 review of Fastback II you said it's a good idea to backup all the

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Table 1: Features of CD-ROM Drives

				
● = yes ○ = no	**Apple** **AppleCD SC** ★★★½	**CD Technology** **Porta-Drive** ★★★★	**Chinon** **CDA-431** ★★★★	**EMAC** **Metro CD** ★★★★
List price	$899	$895	$795	$799
Street price	$795	$685	$599	$699
Pros	Solidly built. Good audio software.	Small and portable. Good performance.	Small and portable. Solidly built. Termination switch.	Solidly built. Good audio software. Internal speaker.
Cons	Slow disc access. SCSI ID is difficult to access.	Limited volume control.* On/off switch on external power supply.	Very slow disc access. Mediocre throughput.	Very slow disc access. Caddy difficult to insert.
Mechanism	Sony CDU 8001	Toshiba XM	Chinon CDS-431	Sanyo ROM-4000
Software				
Driver	Apple	OMI	Chinon	EMAC
CD-ROM	CD-ROM Explorer	Nautilus	Educorp shareware, Nautilus	Nautilus
Audio software	CD Remote	playCD	CD Control	Metro CD Audio
Audio-software type	DA	HyperCard stack	DA	DA
SCSI				
Connectors (number, type)	2, 50-pin	2, 50-pin	2, 50-pin	2, 50-pin
Termination	external	external	switched	external
SCSI-ID selector	pinhole	9-position push wheel	DIP switch	9-position push wheel
Audio				
Volume control	thumb wheel	4-position switch	knob	thumb wheel
Headphone output	1/8-in. miniphone jack	1/8-in. miniphone jack	1/8-in. miniphone jack	1/8-in. miniphone jack
Preamp output	●	●	●	●
Internal speaker	○	○	○	●
Power supply				
Internal/external	internal	external	external	internal
Power switch	back	on external power supply	back	front
Optional battery	○	●	●	○
Auto-switching	○	●	○	●
Case				
AC fuse	○	○	○	●
Fan	○	○	○	○
Indicator lights	power, access	access	power, access	power, access, SCSI Sentry
Metal/plastic	plastic	metal	metal	plastic
Size (L x W x H, in.)	10.5 x 9.5 x 3.25	9.25 x 6 x 2.25	10 x 6 x 2.5	10.5 x 9.5 x 3
Weight	8.8 lb	3.8 lb	6 lb	10 lb
Warranty	1 year	1 year	1 year	1 year
Company	Apple Computer 20525 Mariani Ave. Cupertino, CA 95014 (408) 996-1010	CD Technology 780 Montague Expy. Ste. 407 San Jose, CA 95131 (408) 432-8698	Chinon, Inc. 660 Maple Ave. Torrance, CA 90503 (213) 533-0274	Everex/EMAC 48431 Milmont Dr. Fremont, CA 94538 (800) 821-0806 (415) 683-2226

*CD Technology has announced plans to switch to a rotary-dial control soon.



Last night, someone stole Dave's car. And the scary part is, he never even knew it was gone. The same thing can happen to you if you're leaving your Mac unlocked. Co-workers can cruise through your files, causing accidents and leaving viruses. Or thieves can take what they want—and trash the rest. All good reasons to get DiskLock.™

DiskLock doesn't let anyone into your system without your password. It automatically locks your drive when you shut down, and you can set it to lock when your Mac's been idle for a specified time. Plus, DiskLock lets you choose from three levels of security, including the government standard, DES encryption. That's serious protection.

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Table 1: Features of CD-ROM Drives, continued

● = yes ○ = no	 **Hard Drives International CD-ROM** ★★★½	 **Microtech CD600** ★★★★	 **Mirror CD-ROM** ★★★★½	 **NEC Intersect CDR-72** ★★★
List price	$649	$899	$697	$799
Street price	$599	$689	$697	$699
Pros	Least expensive. Good data performance.	Solidly built. Good performance.	Solidly built. AC outlet. Good performance.	Fast Photoshop performance.
Cons	No preamp output. Limited volume control. Clumsy SCSI ID.	No preamp output. Limited volume control.	Limited volume control. No bundled CD-ROMs.	Slow disc access. No bundled CD-ROMs.
Mechanism	Toshiba XM	Toshiba XM	Toshiba XM	NEC
Software				
Driver	OMI	OMI	Trantor	Trantor
CD-ROM	CD Sampler	Discovery	none	none
Audio software	playCD	Microtraxx, playCD	Music Box	Music Box
Audio-software type	HyperCard stack	DA, HyperCard stack	DA	DA
SCSI				
Connectors (number, type)	2, 50-pin	2, 50-pin	2, 50-pin	2, 50-pin
Termination	external	external	external	external
SCSI-ID selector	DIP switch or jumpers	6-position push wheel	9-position push wheel	DIP switch
Audio				
Volume control	4-position switch	4-position switch	4-position switch	thumb wheel
Headphone output	1/8-in. miniphone jack	1/8-in. miniphone jack	1/8-in. miniphone jack	1/8-in. miniphone jack
Preamp output	○	○	●	●
Internal speaker	○	○	○	○
Power supply				
Internal/external	internal	internal	Internal	internal
Power switch	back	back	back	front
Optional battery	○	○	○	○
Auto-switching	●	●	●	○
Case				
AC fuse	○	●	●	○
Fan	○	○	○	○
Indicator lights	access	power, access	access	power, access
Metal/plastic	metal	plastic	metal	metal
Size (L x W x H, in.)	9 x 8 x 2.75	10.25 x 9.5 x 2.75	11 x 9.75 x 2.5	9.5 x 9 x 3
Weight	11.7 lb	7.1 lb	11 lb	7.7 lb
Warranty	1 year	1 year	1 year	1 year
Company	Hard Drives International 1912 W. 4th St. Tempe, AZ 85281 (800) 234-3475 (602) 967-5128	Microtech International, Inc. 158 Commerce St. East Haven, CT 06512 (800) 626-4276 (203) 468-6223	Mirror Technologies 2644 Patton Rd. Roseville, MN 55113 (800) 654-5294 (612) 633-4450	NEC Technologies USA 1255 Michael Dr. Wood Dale, IL 60191 (800) 366-3632 (708) 860-9500



Arrange your files, folders and applications to fit the way you work, and your hard drive won't be so hard to handle.



The ultimate control panel for file manipulation. The DiskTools DA instantly finds, marks, copies or modifies files.



With QuickLaunch, you can blast off into any application without going back to the desktop.



Don't be stuck on sticky notes. Organize your messages and reminders in File Director's autodialing phone pad DA.



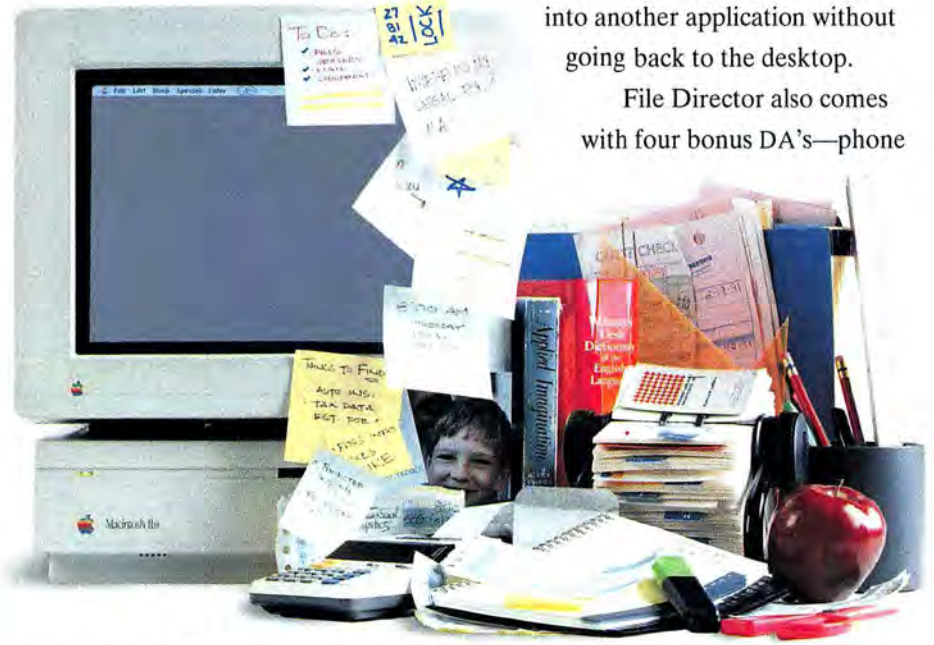
Pop up the calendar DA while you're in any application to make notes or schedule cold calls and hot dates.

It's a contradiction we humans have been living with for millions of years: one brain, two ways of thinking. The right half of the brain is creative and carefree, while the logical left hemisphere is designed to put things in order. So when you try to get your head together and organize your hard disk, the result can be a filing system that doesn't work for either half.

That's why you need File Director,™ the left-brained program for right-brained people. File Director makes everyday operations easier by letting you logically arrange your files, folders, documents and applications on "pages" by date, job, client or whatever makes sense to you.

And with The DiskTools™ DA, opening one window puts you in complete control of finding, moving, copying, deleting and modifying files. You can even QuickLaunch into another application without going back to the desktop.

File Director also comes with four bonus DA's—phone



Got half a mind to get organized? Get File Director.

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Table 1: Features of CD-ROM Drives, continued

● = yes ○ = no	 **OMI** **CDP-1B CD-ROM** ★★★★	 **Optical Access International** **CM 231** ★★★½	 **Pioneer/Relax** **DRM-600** ★★★½	 **PLI** **PL CD-ROM** ★★★★½
List price	$795	$1,049	$1,295	$1,099
Street price	$795	$849	$1,295	$849
Pros	Solidly built. Fast Photoshop performance.	Solidly built. Good audio features. Two-year warranty.	Holds six CD-ROMs. Solidly built. Good volume control.	Solidly built. Termination switches. Good performance.
Cons	HyperCard audio software. No bundled CD-ROMs.	High list price. Nonstandard caddy is difficult to load.	Very slow overall. High price. Internal termination.	High price. Fan may introduce dust onto lens.
Mechanism	Sony CDU-541	LMS CM212	Pioneer DRM-600	Sony CDU-541
Software				
Driver	OMI	Optical Access International	Trantor	Trantor
CD-ROM	none	none	none†	none
Audio software	playCD	Access CD	Music Box	Music Box
Audio-software type	HyperCard stack	DA	DA	DA
SCSI				
Connectors (number, type)	2, 50-pin	2, 50-pin	2, 50-pin	2, 50-pin
Termination	external	external	internal	switched
SCSI-ID selector	7-position push wheel	DIP switch	DIP switch	rotary switch
Audio				
Volume control	thumb wheel	knob	volume knob	thumb wheel
Headphone output	1/8-in. miniphone jack	1/4-in. phone jack	1/8-in. miniphone jack	1/8-in. miniphone jack
Preamp output	●	●	●	●
Internal speaker	○	○	○	○
Power supply				
Internal/external	internal	internal	internal	internal
Power switch	back	front	back	back
Optional battery	○	○	○	○
Auto-switching	●	○	○	○
Case				
AC fuse	○	○	○	●
Fan	○	○	○	●
Indicator lights	access	power, access	power, access, audio	access
Metal/plastic	metal	metal	metal	metal
Size (L x W x H, in.)	13 x 7 x 1.75	11.25 x 12.5 x 3.25	15 x 8.25 x 4.5	9.75 x 9.75 x 2.5
Weight	6.6 lb	12 lb	11.7 lb	7 lb
Warranty	1 year	2 years	1 year	1 year
Company	Optical Media International (OMI) 180 Knowles Dr. Los Gatos, CA 95030 (800) 347-2664 (408) 376-3511	Optical Access International 800 W. Cummings Pk., Ste. 2050 Woburn, MA 01801 (800) 433-5133 (617) 937-3910	Relax Technology 3101 Whipple Rd. Union City, CA 94587 (800) 848-1313 (415) 471-6112	PLI 47421 Bayside Pkwy. Fremont, CA 94538 (800) 288-8754 (415) 657-2211

†A pack of six CD-ROMs — U.S. History on CD-ROM, Countries of the World, Shakespeare, Sherlock Holmes, Birds of America, and Software Potpourri/King James Bible/Movie Database — is available for $395.

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Technical Support (504) 291-7283

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Table 1: Features of CD-ROM Drives, continued

● = yes ○ = no	 **Procom** **MCD 650** ŧŧŧ½	 **Texel** **DM5020** ŧŧŧ	 **Todd Enterprises** **TC DR6050** ŧŧŧŧ	 **Toshiba** **XM3201A** ŧŧŧ
List price	$895	$797	$995	$850
Street price	$665	$797	$895	$699
Pros	Solidly built. Good performance.	Good volume control. Fast Photoshop performance.	Good overall performance, including Photoshop.	Good performance.
Cons	No preamp output. Limited volume control.	No preamp output. No bundled CD-ROMs.	No preamp output. AC cable attached. Internal SCSI ID.	No preamp output. Limited volume control. Clumsy SCSI ID.
Mechanism	Toshiba XM	Shinaken DM-3x1s	Hitachi CDR-3650/1650S	Toshiba XM
Software				
Driver	OMI	Texel	Trantor	OMI
CD-ROM	none	none	none	Discovery
Audio software	playCD	Music Box	Music Box	playCD
Audio-software type	HyperCard stack	DA	DA	HyperCard stack
SCSI				
Connectors (number, type)	2, 50-pin	2, 50-pin	2, 50-pin	2, 50-pin
Termination	external	external	external	external
SCSI-ID selector	rotary switch	DIP switch	DIP switch (internal)	DIP switch
Audio				
Volume control	4-position switch	knob	thumb wheel	4-position switch
Headphone output	1/8-in. miniphone jack	1/8-in. miniphone jack	1/8-in. miniphone jack	1/8-in. miniphone jack
Preamp output	○	○	○	○
Internal speaker	○	○	○	○
Power supply				
Internal/external	internal	internal	internal	internal
Power switch	back	back	back	back
Optional battery	○	○	○	○
Auto-switching	●	○	○	●
Case				
AC fuse	○	●	●	○
Fan	○	○	○	○
Indicator lights	access	access	power, access	access
Metal/plastic	plastic	metal	metal	metal
Size (L x W x H, in.)	10.5 x 9.75 x 2.25	14.5 x 6 x 2	13.5 x 6 x 2.25	9 x 8 x 3
Weight	10 lb	5.7 lb	8 lb	9.9 lb
Warranty	1 year	1 year	1 year	1 year
Company	Procom Technology 200 McCormick Ave. Costa Mesa, CA 92626 (714) 549-9449	Texel 1080 E. Duane Ave, Ste. C Sunnyvale, CA 94086 (800) 348-3935 (408) 736-1374	Todd Enterprises 224 – 249 67th Ave. Bayside, NY 11364 (800) 445-8633 (718) 343-1040	Toshiba Information Systems 9740 Irvine Blvd. Irvine, CA 92718 (800) 456-3475 (714) 583-3000

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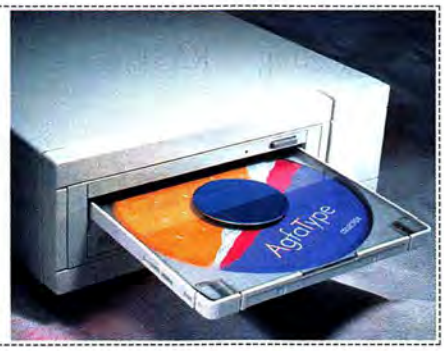
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Requires: Apple Macintosh with 1 megabyte of memory and hard disk. Works with Plus, SE, SE/30, II, IIx, IIcx, IIci, IIfx, Portable, Classic, si, LC, ImageWriter, LaserWriter, Appleshare and Multifinder.

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Silver Platters That Matter

If you do decide to invest in a CD-ROM drive, will there be anything useful or interesting to put into it? Definitely! Here's a sampling of the most interesting CD-ROM titles we've seen so far.

BY THE EDITORS OF MACUSER

CD-ROM has been a medium in search of a message. That's because no matter how fast its throughput or well designed its audio jacks, the world's best CD-ROM drive is only a mediocre compact-disc player until you've got software to play on it. Suppose you do invest in one of the drives featured in this month's CD-ROM lab report? What can you do with it?

Approximately 200 CD-ROM titles are now available for the Mac. *MacUser* surveyed the field to bring you a sampling of the shrink-wrapped titles we think are the most interesting. They range from state-of-the-art multimedia extravaganzas to simple text dumps of classic (and not-so-classic) books. Not every useful CD-ROM is included here, though. If you buy a drive, you might want to purchase one of the public-domain-software libraries published by user groups such as BMUG and the Boston Computer Society. CD-ROM is also a good way to buy bundled-application packages such as The Microsoft Office (Microsoft Corp., One Microsoft Way, Redmond, WA 98052; [206] 882-8080) and The Desktop Music Creativity Kit (Passport Designs, 625 Miramontes Street, Half Moon Bay, CA 94019; [415] 726-0280).

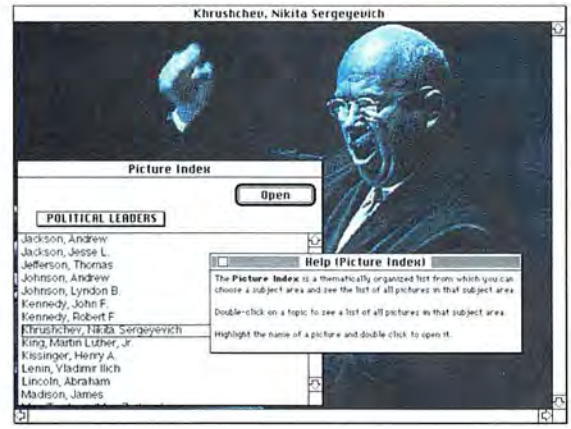
How much software is enough to make CD-ROM viable? If you see one title that's enough to make you want a drive, you've got the answer.

PHOTOGRAPHY: FRED STIMSON



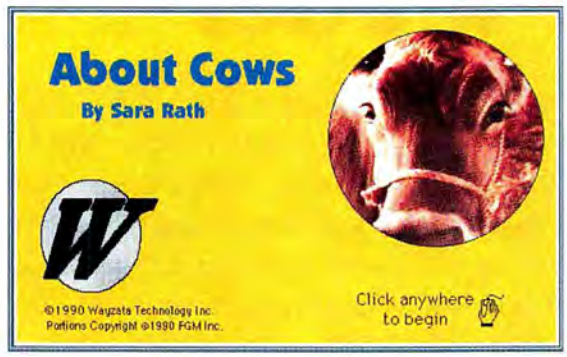






The 1991 New Grolier Electronic Encyclopedia

The 1991 edition of the New Grolier Electronic Encyclopedia (scheduled to ship this summer) includes an astounding amount of information: 33,000 articles containing 10,000,000 words; 2,000 full-color images; 250 color maps; and a broad range of audio selections, including speeches, music, animal sounds, and bird calls. All the information is accessed through a simple Boolean search dialog box (above left). You can select images by using the search engine, as was done to find the Lincoln article and portrait, or by browsing through the Picture Index, as was done for Khrushchev. Images are arranged by subject area, and you select them with a simple double-click. Grolier Electronic Publishing, Sherman Turnpike, Danbury, CT 06816; (800) 356-5590 or (203) 797-3365. $395; annual update, $125; teacher's guide, $49.





About Cows

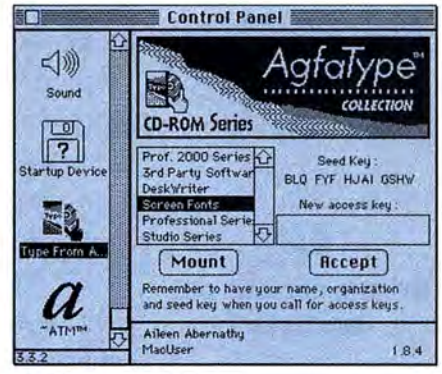
Cows are in vogue, and this novelty book turned CD-ROM attempts to capitalize on that. The text of Sara Rath's 1990 tome on all things bovine has been placed on disc and illustrated with color photographs of cows. Cows standing up. Cows lying down. Cows in barns. Cows painted on barns. You get the idea. If you like cows, this might be just your wad of cud.

About Cows was not designed for the Mac, so don't expect sophisticated HyperText capabilities or slick art direction. As with many titles originally produced for the DOS market, the interface of About Cows will seem primitive to Mac users. Wayzata Technology, Inc., P.O. Box 87, 16221 Main Avenue S.E., Prior Lake, MN 55372; (800) 735-7321 or (612) 447-7321. $39.

AgfaType

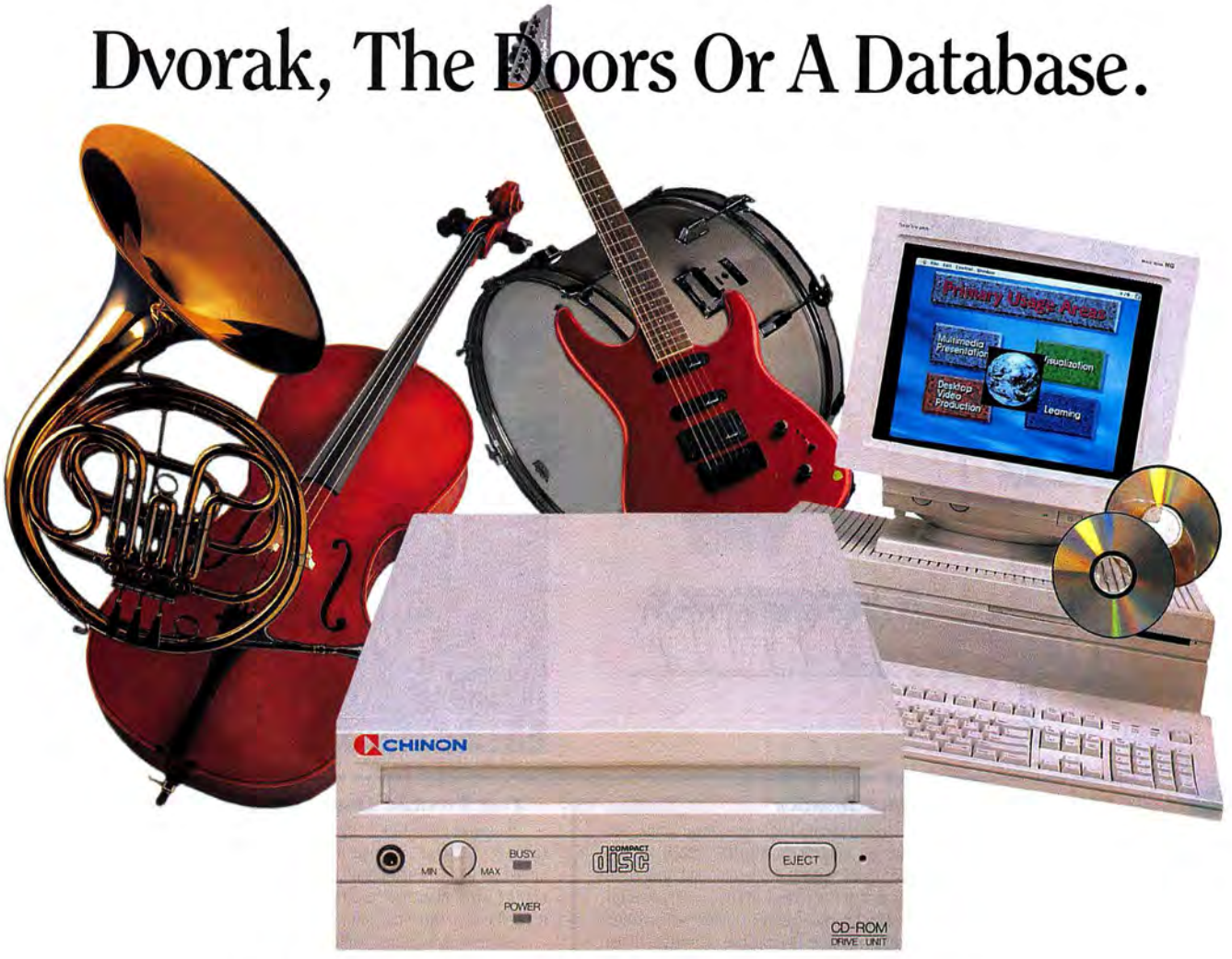
Agfa Compugraphic has placed its — and Adobe's — entire typeface collection on an "unlockable" CD-ROM disc; you pay for only the fonts you use (top). For $1,175, you get the AgfaType 2.0 disc with 20 unlocked fonts *and* a Toshiba CD-ROM drive. You can buy just the disc for the price of a single type volume. The included HyperCard catalog (bottom) provides type samples for all fonts.

Locked away on the disc are 1,152 more PostScript typefaces plus five type-related programs. To unlock them, you call a toll-free number and give a credit-card number to receive the access code. Recently released version 2.1 adds 450 more typefaces, including Pi and symbol fonts. Agfa Compugraphic, 90 Industrial Way, Wilmington, MA 01887; (800) 424-8973. $95 and up.





Dvorak, The Doors Or A Database.



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Every day there's more software published on CD — reference works, databases, graphics libraries and more — all in a convenient, easy-to-use format that can take a lot of heavy use. The CDA-431 reads any disc written in the "High Sierra" or HFS standard formats, giving you access to a vast library.

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Artroom and Darkroom

CD-ROM discs are ideal for distributing libraries of clip art and photographs, so Image Club was an early adopter. The Artroom 5.0 ($799) contains Image Club's entire Digit-Art series of EPS images (left), and there is a utility that lets you search for images by keywords. The Darkroom ($399) contains scanned gray-scale photographs in 300-dpi TIFF format (below). It includes subjects such as businesspeople, industry, science, nature, and cities.

Image Club also offers two other CD-ROMs: LetterPress ($3,999), which contains 613 Image Club typefaces in Type 1 format, and Art + Type Vendor ($99), an unlockable disc that lets you access font and clip-art libraries on a pay-as-you-go basis. Image Club Graphics, 1902 11th Street S.E., Suite 5, Calgary, Alberta T2G 3G2, Canada; (403) 262-8008.



Backgrounds for Multimedia

Artbeats has a reputation for producing superb high-tech backgrounds, and the images on its new Backgrounds for Multimedia CD-ROM ($289) are no exception. The 40 PICT backgrounds come in both 8-bit-color and gray-scale versions as well as in two sizes: large format (for slides) and 640 x 480 pixels (to fit a 13-inch monitor). There is a set of 24-bit anti-aliased images for video users.

Images range from attention grabbers such as Perspective Lines (top) to the more subdued (and universal) Granite (bottom). The disc also contains a large selection of buttons and mortises for enhancing the backgrounds.

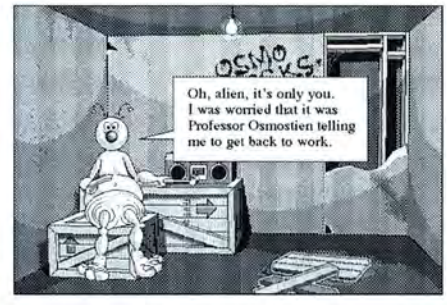
In addition, Artbeats sells the Full Page Images CD-ROM ($509.75), which contains the complete contents of its five EPS background collections. Artbeats, P.O. Box 20083, San Bernardino, CA 92404; (714) 881-1200.

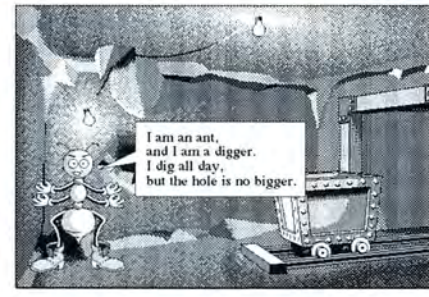


The Cosmic Osmo CD-ROM

The winner of the 1990 Eddy award for best recreational program, The Cosmic Osmo CD-ROM is a 100-megabyte interactive odyssey through Osmoland — an incredibly intricate and relentlessly inventive world that gives an idea of what Lewis Carroll might have created if he had been given a Mac and HyperCard. Is it a game or a work of literature? Actually, it's both.

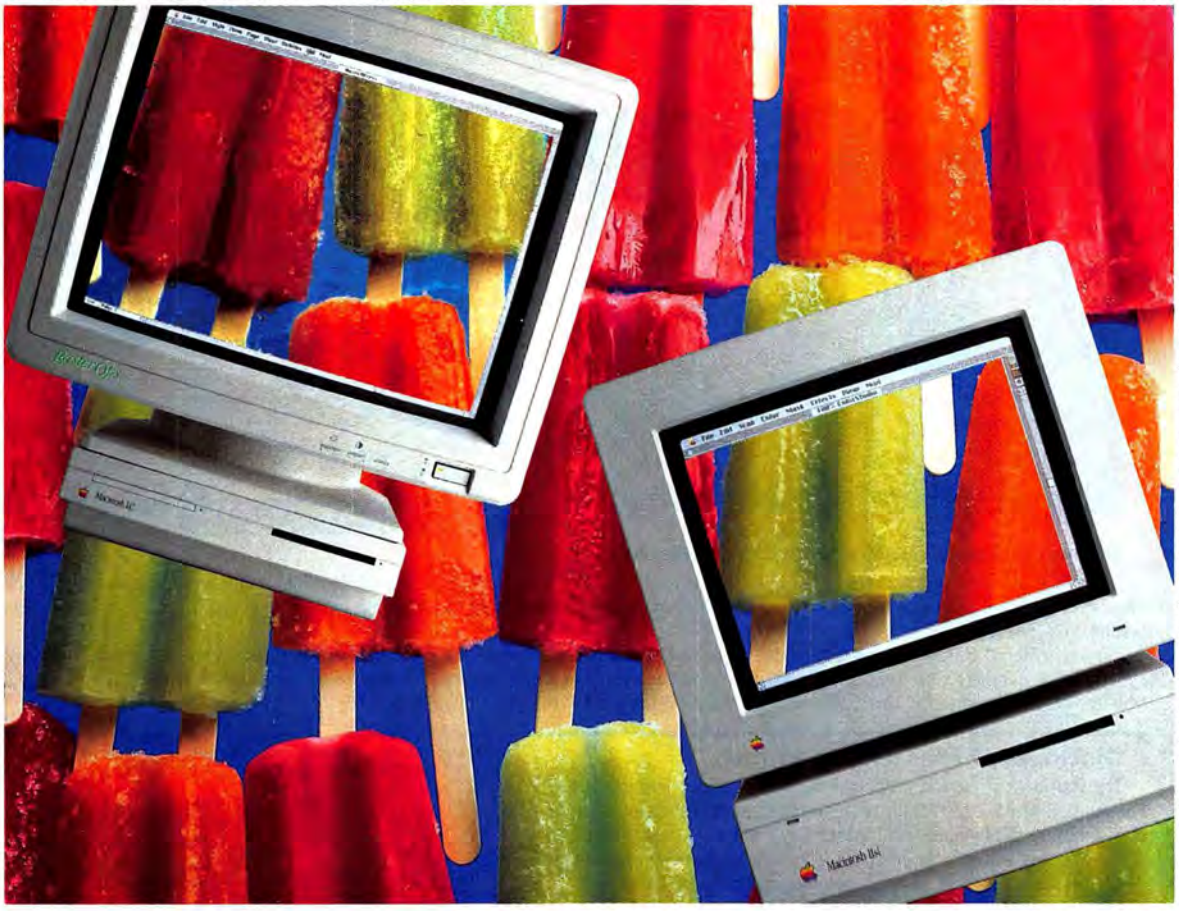
Putting Cosmic Osmo onto CD-ROM made loads of space available to increase the size of the Osmo universe and to enrich it with additional music and animations. The Cosmic Osmo CD-ROM is both a tour de force of HyperCard scripting and a delight for aliens of all ages. Activision, 3885 Bohannon Drive, Menlo Park, CA 94025; (415) 329-0500. $79.95.





RasterOps 8LC Display System and 24si Display Board

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Desert Storm: The First Draft of History

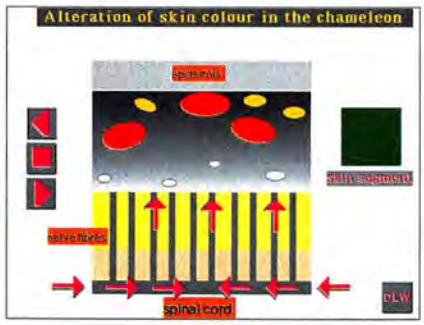
Expected to have shipped in April 1991, Desert Storm: The First Draft of History is a multimedia documentary from Warner New Media about the recent war in the Persian Gulf, as reported by *Time* magazine. The disc contains more than 6,000 pages of text and 300 photographs (in color and black-and-white), much of which was generated by *Time* correspondents' coverage of the war.

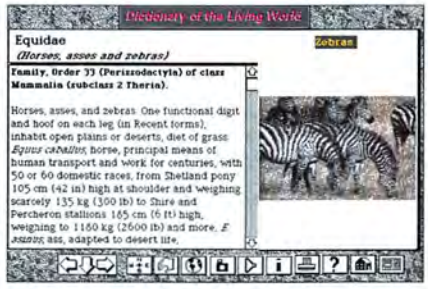
The Desert Storm CD-ROM gives users the option of picking a particular date and immediately gaining access to all the reports, photographs, and audiotapes filed by *Time* correspondents on that day. Other material includes personal profiles and photographs of key players in the conflict, maps of the Gulf area, and a glossary of high-tech weapons. Warner New Media, 3500 W. Olive Avenue, Burbank, CA 91505; (818) 955-9999. $39.95.

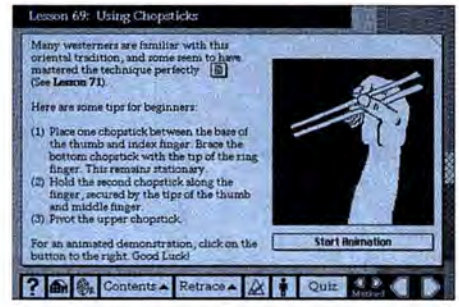
Dictionary of the Living World

The Dictionary of the Living World, from Media Designs Interactive of Hampshire, England, is a brilliantly conceived multimedia database of life on earth. It includes 2,000 entries, featuring maps, color and monochrome images, recorded sounds, and complex animations — many with voice-over narration. This frame (top) — complete with tape-recorder-style playback controls — is from an animated sequence that demonstrates how a chameleon changes color.

The Dictionary also includes brief full-motion video clips. These zebras, for example, first look out at the user and then return to grazing. Built on HyperCard 2.0, the Dictionary provides search, print, and help functions. The main stack is downloaded from the CD-ROM to the user's hard disk, which improves performance and lets the user add cards. Educorp Computer Services, 7434 Trade Street, San Diego, CA 92126; (800) 843-9497 or (619) 536-9999. $299.









Exotic Japan

Exotic Japan is a HyperCard 2.0 stack from Voyager that explores Japanese culture, customs, and language. It is expected to be available by summer 1991. The program is geared to anyone with an interest in Japanese culture, but it is particularly useful for business travelers who need to brush up on their Far Eastern manners and mores. For instance, what's the *right* way to handle a pair of chopsticks?

One of Exotic Japan's most useful features is its language capability. Although it's not intended to teach you how to speak fluent Japanese, there's a useful audio phrase book that has correct pronunciations digitized and stored on-disc. With a Mac LC, a Mac IIsi, or Farallon MacRecorder, you can record your own pronunciations and then compare them to the correct ones. The Voyager Co., 1351 Pacific Coast Highway, Santa Monica, CA 90401; (213) 451-1383. $99.95.

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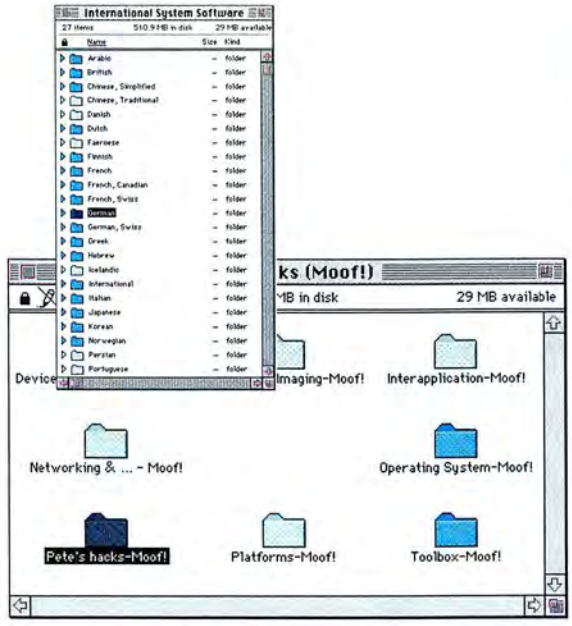
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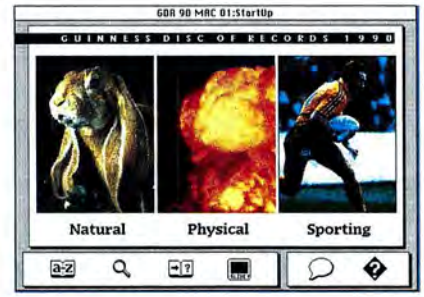
Registered Apple developers are lucky enough to receive a new developer's CD-ROM approximately every three months. Each disc has a new and silly name — the current one is Gorillas in the Disc. Each developer CD-ROM contains every version of U.S. System software — even System 0.1 — as well as all current versions of international System software. Apple's developer technical support also contributes source code and many useful tools.

Apple has not made these CDs available to the general public, because they contain software that is still under development or that hasn't passed through the formal quality-assurance process. For most users, this software is of little use and is potentially dangerous. But for a developer, these CDs become indispensable very quickly. Apple Computer, Inc., 20525 Mariani Avenue, Cupertino, CA 95014; (408) 996-1010.

The Guinness Disc of Records

The Guinness Book of Records is one of the world's most browsable books, making it a natural for transformation into a CD-ROM title. Thankfully, the CD-ROM's publishers did more than merely dump the words to disc and scan in a few pictures. This disc is a HyperCard stack that comes with a third-party search engine called HyperKRS.

The entire text of the 1990 edition of *The Guinness Book of Records* is included on-disc. Although the stack design is not as sophisticated as those from Voyager and Warner New Media, it does feature color photographs (such as the fire walker pictured below), sound, and some animation. In The Guinness Disc of Records, you can not only read about the world's fastest talker but you can also listen to him do his spiel. Britannica Software, Inc., 345 Fourth Street, San Francisco, CA 94107; (800) 533-0130 or (415) 597-5555. $149.95.









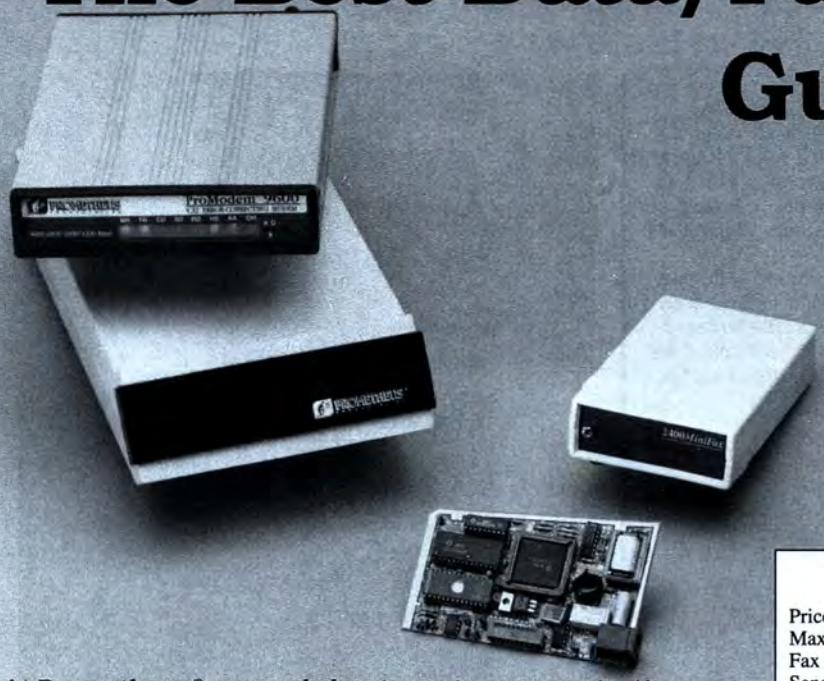
International Graphics Library and Ocean Imagery

Educorp offers a variety of graphics-related CD-ROM discs. One of the best is the International Graphics Library ($299), which contains more than 200 color and gray-scale images (left) created by Emmy-award-winning designers. The business graphics and backgrounds come in PICT as well as TIFF formats and include flags, money, maps, and political themes.

Ocean Imagery ($99) contains more than 100 scanned images of ocean views and water sports (right) by photographer Rick Doyle. Educorp's other CD-ROM offerings include the NEC series (fonts, photography, and clip art) and the Comstock photography collections. Educorp Computer Services, 7434 Trade Street, San Diego, CA 92126; (800) 843-9497 or (619) 536-9999.

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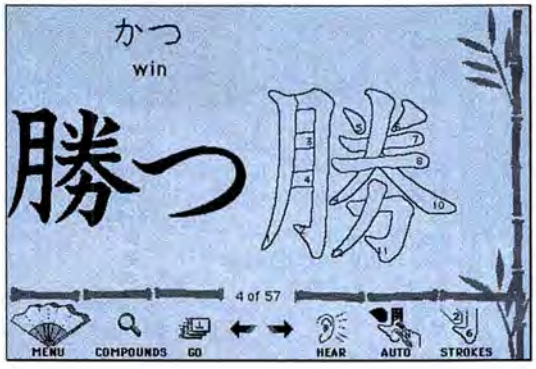
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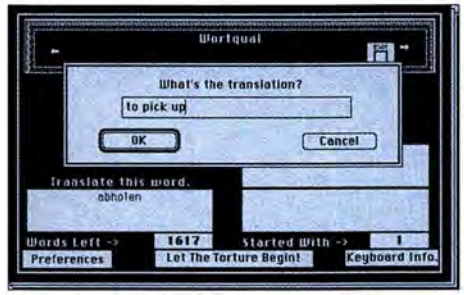
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LinguaROM

LinguaROM contains 27 HyperCard stacks — 63 megabytes of Spanish, Russian, Italian, Japanese, French, German, and Chinese tutorial materials — from HyperGlot Products, a leading vendor of language-instruction software. A variety of teaching techniques is used, including pronunciation drills (with digitized audio); verb tutors; and the Japanese Kanjimaster (top), which teaches the proper stroke sequences, pronunciations, and meanings of dozens of characters.

Except for Chinese and Japanese, each language's instructional materials include a Word Torture stack — an automated drill on 1,400 to 1,600 commonly used words. The Word Torture stacks, like the one below from the German set, let you record your own pronunciation for comparison with prerecorded examples. Educorp Computer Services, 7434 Trade Street, San Diego, CA 92126; (800) 843-9497 or (619) 536-9999. $499.





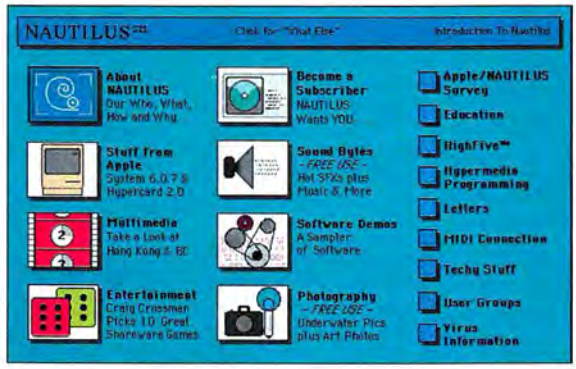


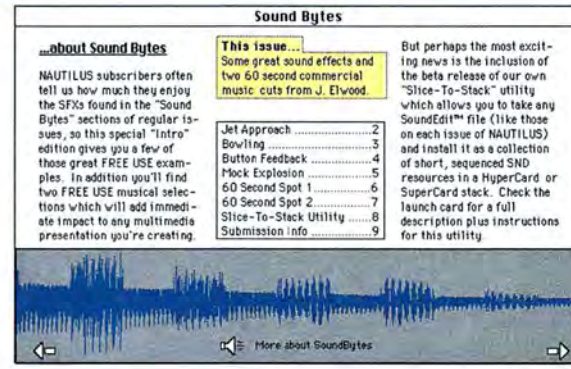


MultiMedia World of Travel: Volume 1 — The Orient

InterOptica Publishing Ltd., of Hong Kong, is developing an ambitious six-volume sound-and-image Interactive Travel Encyclopedia. When complete, the Encyclopedia will provide comprehensive travel information for the Orient, the Caribbean, Europe, North America, Oceania, and Africa. As this menu (bottom) shows, the easy-to-use interface is distinguished by its exceptional graphics; audio on-line help is provided in English, Dutch, French, German, Italian, and Spanish.

A series of increasingly detailed maps leads users from a view of the entire Pacific Rim to Hong Kong Island, for example. Further choices give information about various accommodations and local attractions. Some choices are linked to sound, music, animations, color photographs, or extensive textual descriptions. Many street maps are also available. Bureau of Electronic Publishing, Inc., 141 New Road, Parsippany, NJ 07054; (800) 828-4766 or (201) 808-2700. $299.





Nautilus

Nautilus is a CD-ROM periodical that appears every four weeks. Each disc contains a potpourri of utilities, shareware, system software, technical articles, HyperCard stacks, software demonstrations, and multimedia presentations. The contents of each disc are supplied by individual and corporate contributors.

Because sampled sound files consume so much space, they are ideal for distribution via CD-ROM. Nautilus offers sound samples at a variety of sampling rates, including 44-kilohertz samples that can be used with Digidesign's AudioMedia board. Public-domain MIDI files are also available. Discovery Systems, 7001 Discovery Blvd., Dublin, OH 43017; (800) 365-1639 or (614) 761-2000. $119.40 for 12 issues.

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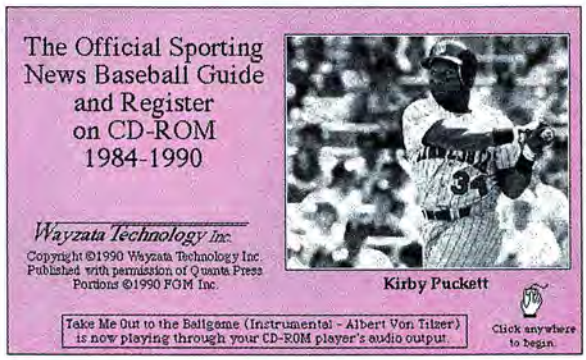
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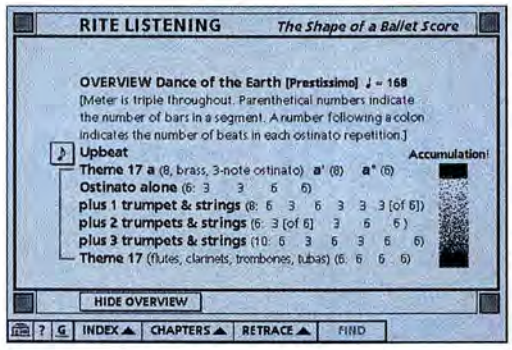


The Official Sporting News Baseball Guide and Register

This straightforward compilation of text and data contains all the major-league-baseball articles printed in *The Sporting News* magazine from 1984 to 1990. For true baseball fanatics who can never get enough information, this CD-ROM also includes statistics of all the players and teams during that period, names of all the individual award winners, details of all play-off and World Series games, and 1,000 captioned photos.

The Official Guide and Register hits a solid homer with its wealth of information, but its search-and-display capabilities are a weak pop fly. Although multiple keywords can be used to define a search, the program shows users only the articles that contain the searched text but does not specifically show the searched text within an article. Also, only one captioned image or article can be viewed at a time. Wayzata Technology, Inc., P.O. Box 87, 16221 Main Avenue, Prior Lake, MN 55372; (800) 735-7321 or (612) 447-7321. $99.





The Rite of Spring

Voyager pioneered the idea of interactive music appreciation with its CD-ROM of Beethoven's Ninth Symphony. The Rite of Spring further ups the ante with a state-of-the-art HyperCard 2.0 stack. Stravinsky's ballet score is a particularly rich subject, and author Robert Winter explores it with in-depth material on the score itself, the ballet (and how it was reconstructed), and Stravinsky himself.

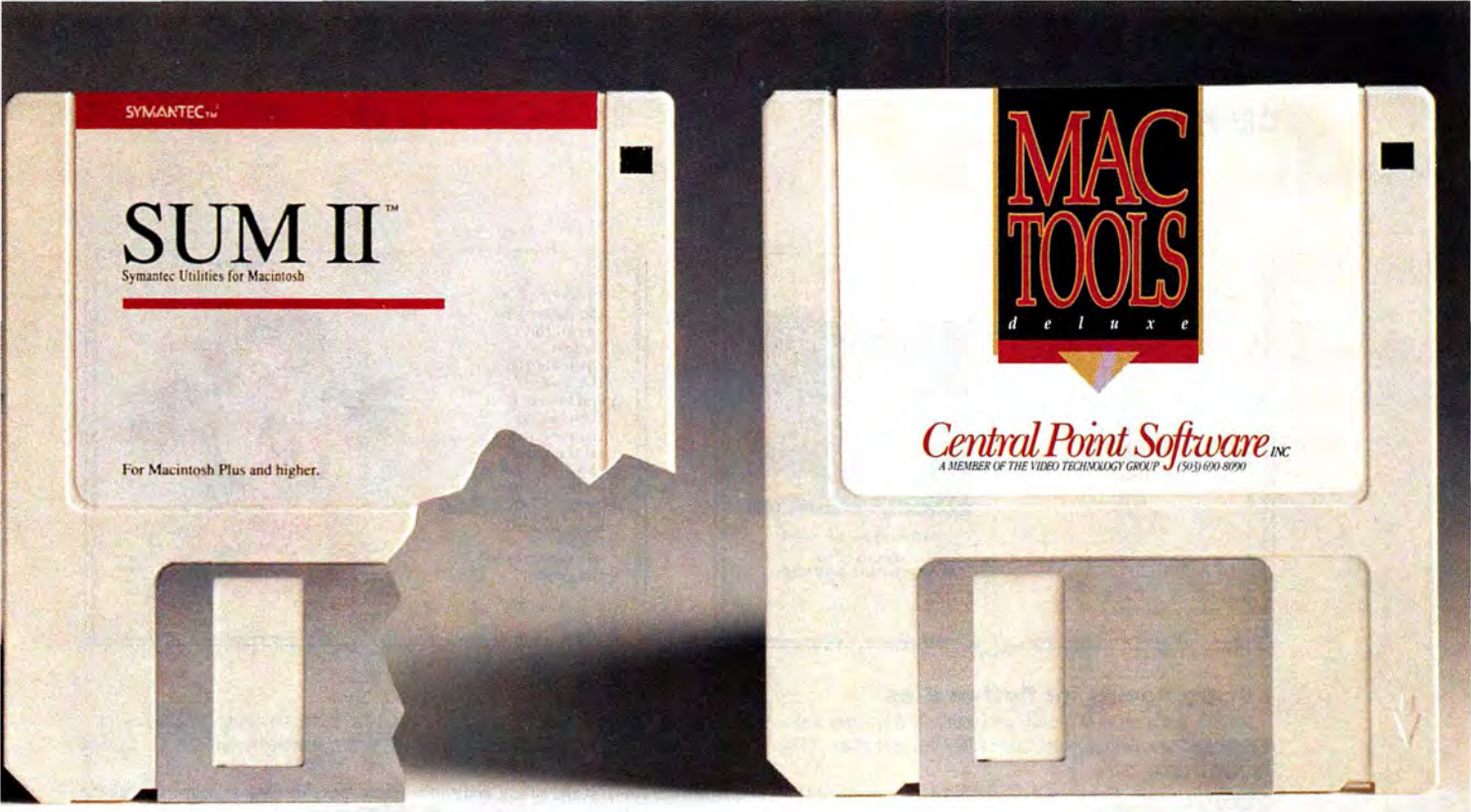
Following the score to The Rite of Spring is a challenge for conductors and orchestras, not to mention ordinary listeners. Examples such as the one pictured here help demystify the intricate rhythms at the heart of the music. The Rite of Spring is the perfect showcase for both the musical abilities of the CD-ROM medium and the multimedia power of HyperCard 2.0. The Voyager Co., 1351 Pacific Coast Highway, Santa Monica, CA 90401; (213) 451-1383. $99.95.

Quality Artware and Somak LaserArt

For those who like images with a hand-sketched look, Quality Artware offers more than 600 images in 400-dpi TIFF format (top two images). Subjects include business, politics, the environment, fashion, and fantasy. The disc also contains EPS borders, StuffIt Classic, a TIFF-to-PICT conversion utility, and demos for various graphics programs and games. FM Waves, 70 Derby Alley, San Francisco, CA 94102; (800) 487-1234 or (415) 474-7464. $279.

The Somak LaserArt discs provide a generous helping of public-domain and shareware artwork (bottom two images). Volume 1 contains more than 500 EPS images of various topics and 30 Type 3 display fonts, and Volume 2 has 375 EPS images that focus on sports, recreation, and nautical themes, along with 30 more fonts. Somak Software, 535 Encinitas Blvd., Suite 113, Encinitas, CA 92024; (800) 842-5020 or (619) 942-2556. $59 each.





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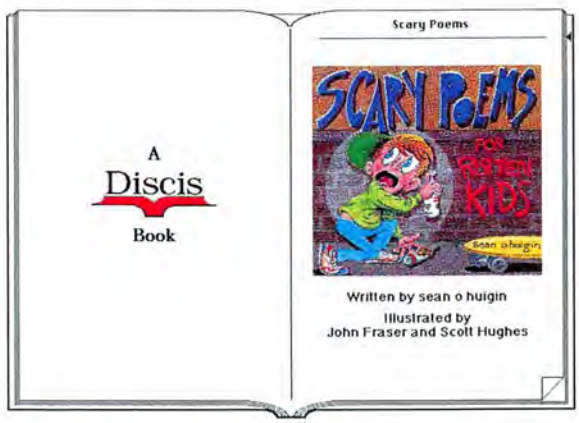
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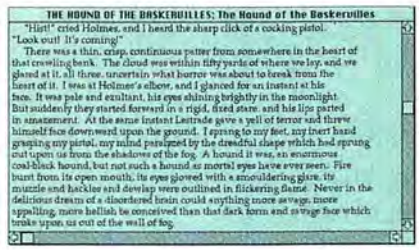
This is one of a series of children's book titles that has been transformed into delightful interactive CD-ROM stories. The Discis Books series won the Eddy award in 1990 for best education program. Other titles include The Tale of Peter Rabbit, Cinderella, The Paper Bag Princess, Heather Hits Her First Home Run, and A Long Hard Day on the Ranch.

As children "turn" the pages of a Discis book, they are treated to high-quality illustrations, sound effects, and music. Discis books are invaluable tools for learning to read because, besides hearing the story read aloud, children can request pronunciations of individual words and objects. Discis Knowledge Research, Inc., 45 Sheppard Avenue E., Suite 410, North York, Ontario M2N 5W9, Canada; (800) 567-4321 or (416) 250-6537. $84.95

Sherlock Holmes on Disc

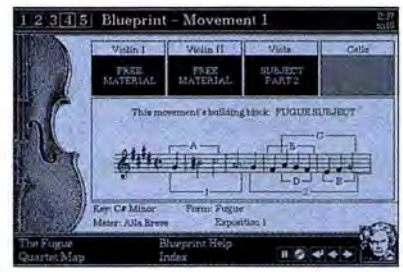
Sherlock Holmes on Disc contains the full text of all the Sherlock Holmes stories and novels as well as the full text of the *Medical Case Books* of Sir Arthur Conan Doyle. This particular edition of Sherlockiana has a definite medical flavor (perhaps because it comes from a publisher of 23 medical titles) and includes, for no apparent reason, the medical poetry of Dr. George S. Bascom. The text is searchable.

The illustrations that come with Sherlock Holmes on Disc are 75 linoleum-block prints carved by Dr. George Wells in the 1960s. These seem to have been included mostly because they were done by a physician rather than for any artistic or historical merit. As Dr. Watson said in *The Adventure of the Blanched Soldier*, "What a pity." CMC ReSearch, Inc., 7150 S.W. Hampton, Portland, OR 97223; (800) 262-7668 or (503) 639-3395. $99.







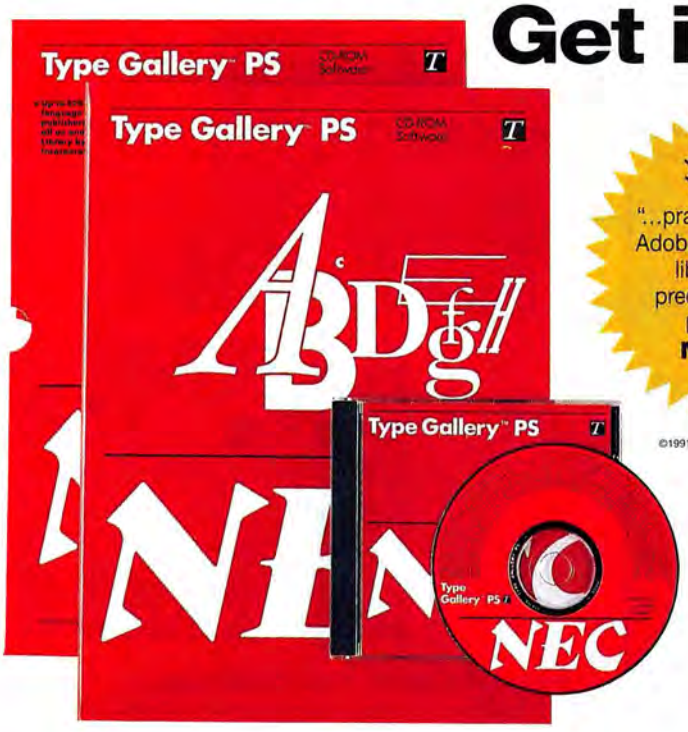


The String Quartet

Warner New Media's Audio Notes series is one of two music-appreciation series now in production (the other being Voyager's CD Companion series). There are two currently available titles, The Magic Flute and The String Quartet. The latter deals with Beethoven's String Quartet No. 14, Op. 131, a work of immense complexity and beauty. The program is a HyperCard stack that offers detailed explanation and analysis of the music while you're listening to it.

Supplementary material on Beethoven's life (including a fascinating exploration of his deafness), chamber music, and musicological concepts is plentiful. The String Quartet should be of great interest to any classical-music lover and should prove indispensable to music educators. Warner New Media, 3500 W. Olive Avenue, Burbank, CA 91505; (818) 955-9999. $66.

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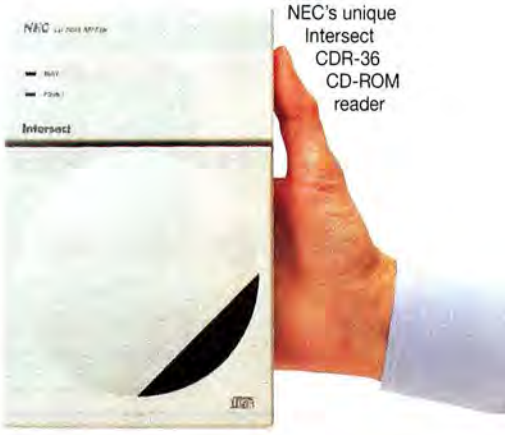
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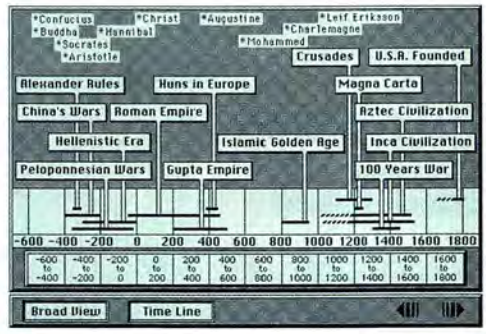
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Time Table of History — Science and Innovation

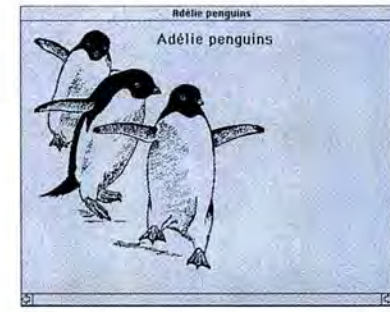
This extensively cross-referenced HyperCard stack includes more than 6,000 cards, or stories, that outline history from the Big Bang to the present. A sophisticated — and fast — search capability allows multiple Boolean expressions and can restrict searches to a user-specified date range. Some stories contain multimedia effects, and all text is *hot:* Each word is linked directly to other related stories.

In addition to the story screens, the Time Table of History includes a variety of time lines. Click on a Historical Context button (such as Huns in Europe) to hear a voice-over description of the event. Additional time lines include Geochronology, Archaeology, and the Schumpter Theory of Economic Cycles. Xiphias, 8758 Venice Blvd., Los Angeles, CA 90034; (213) 841-2790. $129.





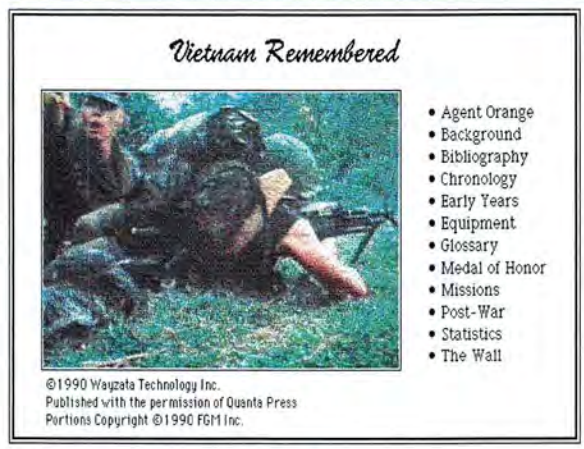


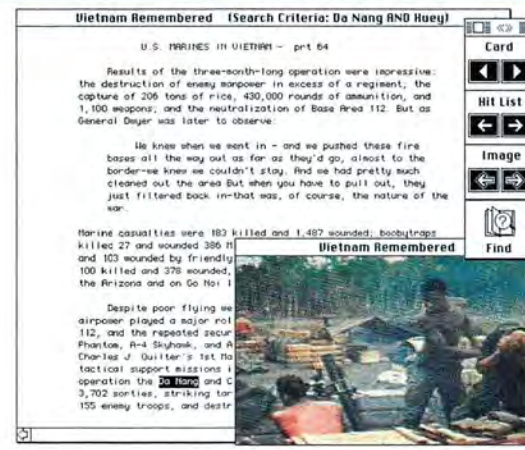


Webster's Ninth New Collegiate

Merriam-Webster has a long tradition of publishing the most authoritative American dictionary. It's an influential source for publishers, with its regular use at the U.S. Government Printing Office, The University of Chicago, and *MacUser*. The main benefit of having it on CD-ROM rather than in its familiar red dust jacket, however, is that each of its 160,000 entries is clearly and correctly pronounced on demand.

The CD-ROM version of *Webster's Ninth* also has illustrations, but they're the same ones that appear in the print edition, which aren't exciting by any standard. As for the dictionary that everyone most wants to see on CD-ROM, *The Oxford Dictionary of the English Language,* it's coming — but only for DOS machines. Highlighted Data, P.O. Box 17229, Washington, DC 20041; (703) 533-1939. $199.95.





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Vietnam Remembered is hampered by its limited search-and-display capabilities. The screen shot shown above right, for example, is actually a composite of two different screens, one with text and one that displays the full-color image — Vietnam Remembered's search engine cannot display an article and an image simultaneously. Wayzata Technology, Inc., P.O. Box 87, 16221 Main Avenue, Prior Lake, MN 55372; (800) 735-7321 or (612) 447-7321. $129.

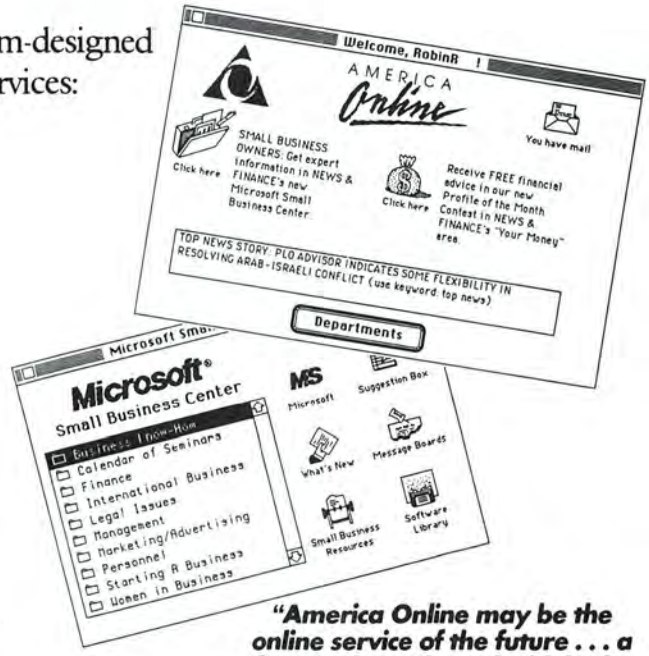
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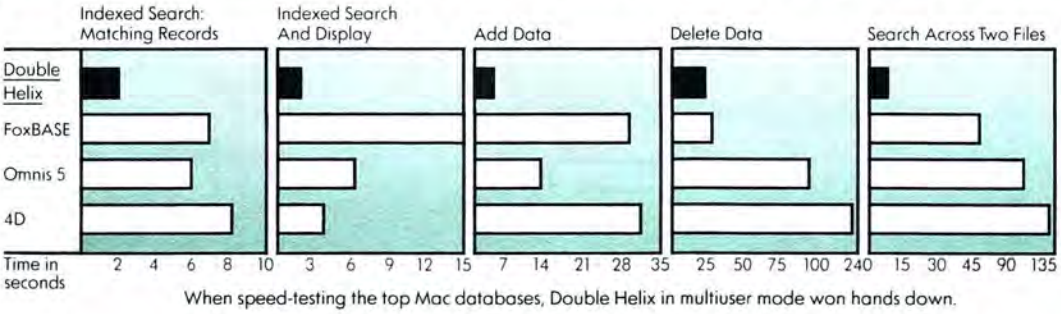
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Aldus has announced Additions, a new technology that dramatically extends PageMaker's capabilities. Additions combines the concepts of Letraset's DesignScript and Quark's XTensions — it provides a scripting language for users, enables third parties to write PageMaker add-ons, and provides a way to dynamically link PageMaker with other applications. This latter capability can let you use another program, such as Excel or HyperCard, as a front end to PageMaker.

By Aileen Abernathy



A new font frenzy: Adobe has stolen the march on Apple's TrueType by announcing its Multiple Masters technology, an extension to the Type 1 specs. A single MM font contains two or more master designs, representing extremes of weight, width, size, and/or style. From these masters, users can create an almost infinite number of "in between" fonts. Basically, MM is a blend tool for type: If you had an MM font containing masters for the light and bold weights of a typeface, for instance, you could generate one or more fonts of intermediate weight. ✲ The benefits? Optical scaling for maximum readability at every point size, font substitutions that match missing fonts in size and width, improved copy fitting that uses subtly altered font sizes or widths, and extremely compact file sizes (relative to the data they contain). ✲ Adobe plans to ship its first MM products by year's end; the first MM faces will likely be Adobe Sans and Minion. Adobe will provide a stand-alone MM font-creator program, and developers can add this capability to their applications (expect an MM dialog box in future versions of Illustrator). Existing Type 1 fonts won't work with the MM technology, however, and it's too early to say how many other font vendors will develop MM fonts.



Adobe continues its rapid-fire product delivery with Streamline 2.0. This long-overdue upgrade of the company's PostScript auto-tracing program can trace gray-scale images, and traced art can be assigned colors or grays, which are now readable by Illustrator 88 or 3.0. You can trace elements as separate shapes for easy editing, and the line-recognition feature is great for converting forms — it automatically straightens crooked lines and strips out text. In addition, you can now save images in PICT or DXF format. The $195 list price is equally impressive — it's *half* the original price (and upgrades are free). How's that for reverse inflation?

Product news: If you want to create typefaces that look identical on different platforms, Fontographer 3.2 may offer just what you need. The latest version of Altsys' font-creation program lets you design NeXT-compatible fonts as well as PC Type 1 fonts that are compatible with ATM running under Windows 3.0. ✲ The Mac version of Ventura Publisher has had a cool reception thus far, so Ventura Software is upping the ante with 12 international dictionaries ($99 per set of four, version 3.0.1 of Ventura Publisher required) and a special deal that allows user groups (Macintosh or Ventura) to buy one copy of Ventura Publisher for $75.



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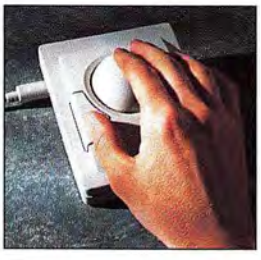
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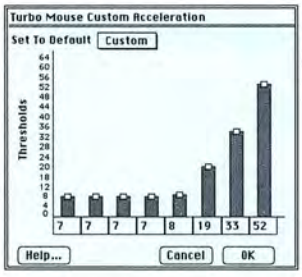
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Photoshop Unmasked

An expert from Adobe Systems explains the mysteries of Photoshop's masks and alpha channels and tells how you can use them in your work.

By Steven Guttman

There are certain fundamental concepts that can make life a lot easier. Basic stuff such as red means stop, green means go; the gas pedal is on the right, the brake is on the left. The principle of *masking* (used in image-editing and painting programs such as ColorStudio, Studio/8, Studio/32, and Photoshop) is one such concept. It's such a simple and powerful idea that once you understand it, you can create all sorts of wonderful effects. On the other hand, if you *don't* understand the many uses of masks, you'll miss out on an important aspect of these sophisticated — and often expensive — programs.

Masking lets you isolate an area you want to work on and protects the area *outside* the selection from the effects of filters, paintbrushes, or other tools. In Photoshop, you create a mask (formally known as a *selection mask*) when you select part of an image. Masking is a powerful tool because it allows you to manipulate selected areas of your image without having to worry about damaging adjoining zones. In photo retouching, for example, masks let you change the color balance or contrast only in selected regions of an image.

Cold Storage for Masks

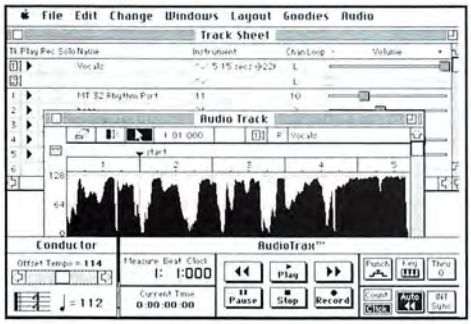
Although Photoshop is not the only product that lets you create masks, it does have a unique means — called *alpha channels* — of storing and manipulating them. Alpha channels are 8-bit gray-scale representations of an image that you create by selecting part of the image and copying it into a separate channel, using the Selection->Alpha command, on the Select menu. (In Photoshop 2.0, which will be available soon, this command will be called Save Selection.) Think of alpha channels as cold storage for masks: Photoshop lets you save as many as 13 alpha channels for each 24-bit color image and as many as 15 for a gray-scale image. You can save alpha channels only if the associated image is saved in Photoshop format, however; if the image is saved in any other format (such as TIFF), all the alpha-channel information will be lost.

The ability to save and restore masks makes working on images a lot easier. For example, it's frustrating to painstakingly outline an area of an image with the lasso tool, work on it, make another selection (thus losing the first one), and then realize that you need to go back to the first area. With the Selection->Alpha command, however, you can copy the first selection to an alpha channel. When you need to use it again, you can bring it to the foreground by selecting the channel number from the Channel submenu, on the Mode menu, and then use the Alpha->Selection command (in Photoshop 2.0, this command will be Load Selection) to make that alpha channel the active selection mask. (Channels eat up both memory and hard-disk space, so be sure to delete unneeded channels with the Delete Channel command, on the Mode menu.)

Alpha channels describe exactly the same thing as any other Mac marquee (the moving



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Figure 1: Although an alpha channel (right) shows the same information as a selection delineated by a marquee (left), it looks much different. When a selection is copied to an alpha channel, everything outside the selection is black and therefore not editable and everything inside the selection is white or shades of gray and can be edited, using Photoshop's painting tools.



Figure 2: You can use any of Photoshop's filters, painting tools, or selection tools to modify the image within an alpha channel. The type in this example was reversed out in an alpha channel and then chosen as the active selection mask. By increasing the brightness of the areas inside the letterforms, you make the letters seem to ghost through the image.

dashed lines that show the boundaries of a selection). Using a marquee tool is a simplified way of delineating the mask, because it shows only its edges. If you copy the selection to an alpha channel, you get a clearer view of the mask, because the alpha channel contains the whole image, with everything outside the selection being black and everything inside the selection being white or shades of gray (see Figure 1). The black areas in an alpha channel represent portions of the image that cannot be affected by paint and other effects, the white areas represent portions of the mask that can be manipulated with paint or filters, and the gray areas are semitransparent — only part of the effect will be applied to the image, depending on the intensity of the gray values.

You can also create an alpha channel

without selecting part of an image. By adding elements — text, shapes, or blends — to an empty alpha channel, you can quickly create custom masks. For example you might fill an alpha channel with a gradient that progresses from black to white, copy that gradient into the selection mask, and then paint on top of the image. The paint would go from opaque (where the mask was white) to fully transparent (where the mask was black) and become semitransparent in between (depending on the shade of gray in the mask).

To use a darkroom analogy, think of the mask as a large piece of film you are holding between the lens of an enlarger (which is projecting your image) and your photographic paper. Black areas of the mask prevent the light from shining through, so the corresponding portions of the photographic paper aren't exposed; white areas are transparent to the enlarger's light and expose the photographic paper; and gray areas of the mask weaken the light, so the amount of light that shines through depends on the gray's opacity.

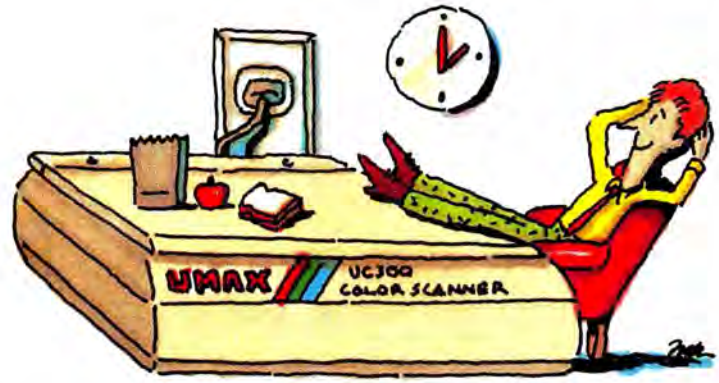
Because alpha channels are editable images, you can use any of Photoshop's filters, painting tools, or selection tools to modify the image within an alpha channel. For example, you can use the type tool to lay down a block of text in an alpha channel, and you can reverse out the text with the Invert command (Command-I). If you subsequently make this channel an active selection mask with the Alpha ->Selection command, you'll notice that the perimeter of each letter is selected. *Only* the white areas within the alpha channel (in this case, the letters) can be modified once the alpha channel has been copied to the selection mask, so you can use the Brightness/Contrast control (Command-B) to increase the brightness of the areas inside the letterforms. This makes the letters appear to be "ghosting" through the image (see Figure 2).

The 8-Bit Advantage

Photoshop's alpha channels are gray-scale images, so you can use them to do complex 8-bit masking (1-bit masking distinguishes only between what is inside and what is outside a selection). The 8-bit mask lets you create soft-edged (or feathered) selections that blend in with the rest of the image — vital if you're creating subtle photo-realistic effects.

For example, if you make a selection and then increase the brightness within the area you selected, you see an abrupt

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Figure 3: By using a pattern or picture as a selection mask, you can create an interesting textured effect. Here a geometric pattern is used as a selection mask. When you paint on the image, the pattern appears, because the paint flows *only* into the areas of the pattern that were white within the alpha channel. You can colorize this pattern by using the Hue/Saturation controls (the changes are applied only to the white areas of the pattern in the alpha channel).

delineation between the selection and the rest of the image at the selection's edge. Look at the selection in an alpha channel to see why: There's a definite edge where the mask goes from black to white. However, if you "feather" the selection's edges, using Photoshop's Feather command (on the Select menu), and *then* change the brightness, you'll get a smooth transition from the inside to the outside of the masked area. Again, look at the mask within an alpha channel to see why: Between the white area (which represents the inside of the mask) and the black area (which indicates the outside of the mask) is a gradient of gray values where the edges were feathered. Because the gray values act as a filter, they soften the transition at the selection's boundary. This capability makes photo-realistic adjustments or composites possible.

The 8-bit-masking capability of alpha channels lets you create effects such as "textured" masks and montages. Here's a sampling of what you can do:

• To create a textured mask, select a

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pattern or picture and choose the Define Pattern command from the Edit menu to make it a Photoshop pattern. Fill an alpha channel with this pattern (using the Fill command from the Edit menu), and make it a selection mask with the Alpha->Selection command. (Because of the complexity of the selection at this point, you may want to suppress its flickering edges with the Hide Edges command.) You now get a textured effect when you paint on the image, because the paint flows *only* into the areas of the pattern that were white within the alpha channel (see Figure 3).

You can vary this effect by using the Hue/Saturation controls to dramatically colorize the image (again, the changes are applied only to the white areas of the alpha-channel pattern). Or you can take another image and, using the Paste Into command, on the Edit menu, paste it into the selection. The image will flow only into the areas of the pattern that were white within the alpha channel.

• Eight-bit masking lets you create a very effective "ghosting" effect. Paste a gray-scale image into an alpha channel, and then make it the active selection mask. By using the Levels control to change the contrast, you can make the letters ghost through the image.

• To create a montage with one image gradually blending into another, you must modify one of the images so that it behaves like a gradient fill — that is, the pixels are opaque at one side of the image and transparent at the other, with a transition area in the middle. To do this, create a linear-gradient fill in a new alpha channel and make this channel the active selection mask. The mask will be applied to the entire image, giving it the same properties as the gradient fill. This means that the image's pixels will now follow a gradient from opaque to transparent, matching that of the alpha channel. Copy the selection to the Clipboard, and then paste it on top of a second image. The pasted image will merge with the background artwork to create the effect of one image blending into the other. The background art will be hidden where the first image's pixels are opaque and will show through where its pixels are transparent.

• The same principle lets you create a vignette (a picture that shades gradually into the background). Use the New Channel command to create an alpha channel, and create a radial blend going from black (in the middle) to white. Make the alpha channel the active selection mask, and apply the Gaussian Blur filter to the image. The selection mask controls the strength of the filter's effect—the image is intensely blurred toward the edge (where the alpha selection is white) and unchanged in the center (where it is black), following the gradient created in the alpha channel.

There's really no limit to what you can do with masks — they let you create startling effects or make radical changes that appear perfectly natural. And with the subtlety that Photoshop's alpha channels give you, the effects you create are limited only by your imagination.

Steve Guttman is the product manager for Adobe Photoshop.

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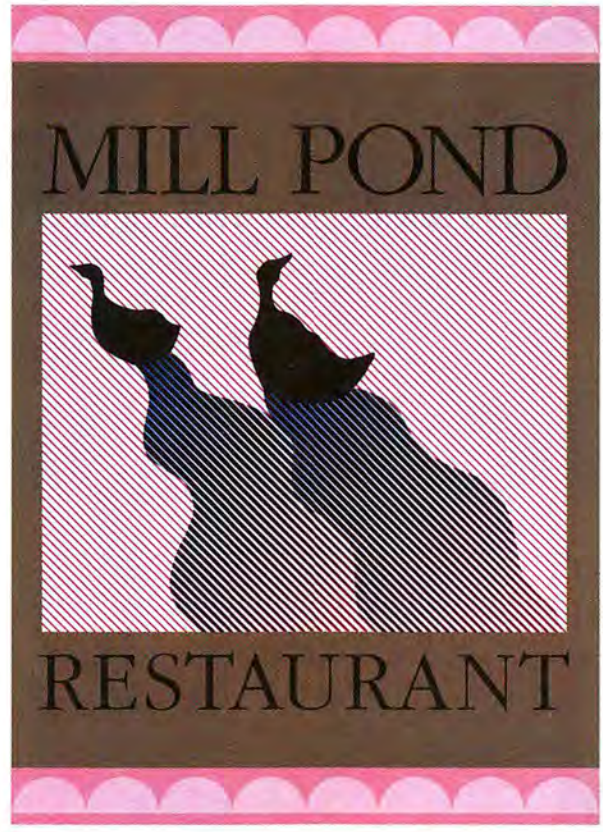
Screened Effects

Want a quick-and-easy method for creating eye-catching art? Try altering a program's halftone screens.

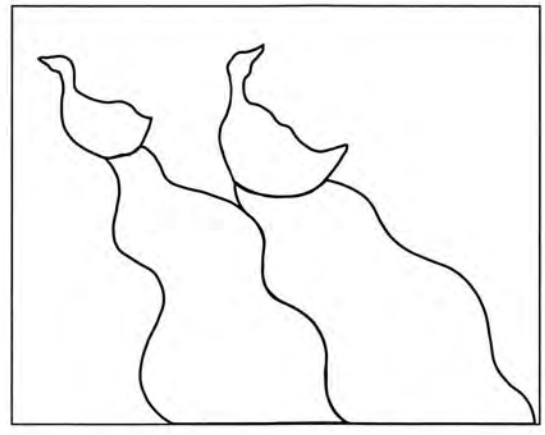
By Janet Ashford

When computer artwork is reproduced on paper or film, it is converted to a pattern of very small dots. From a distance, this dot pattern — called a *halftone* — coalesces into a meaningful image. The dots are usually round and arranged in a grid, or *screen*, at frequencies of 65 to 150 lpi (lines of dots per inch). The size of each dot determines how dark its area of the image will appear. Screens made of straight lines are also available, in which case the thickness of the lines defines the light and dark areas.

Most output devices — laser printers and imagesetters — default to round- or elliptical-dot screens, but some graphics programs let you change the parameters. In FreeHand, for example, you can specify the type of halftone screen (dot or line), the frequency (lines per inch), and the angle of any element within a graphic or of the graphic as a whole. By manipulating these options, you can achieve some interesting special effects (see image at top right). FreeHand also lets you alter the screens applied to imported TIFF images, as do image-editing programs such as Photoshop and Digital Darkroom. Note that none of these special halftone effects show up on-screen; they appear only when the image is printed.



When a low-frequency line screen is applied to a simple FreeHand drawing of ducks on water, the artwork takes on the look of a line drawing or woodcut.



1 Creating the Drawing

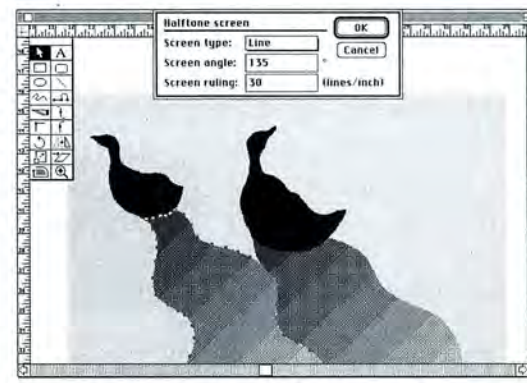
A basic pencil drawing of ducks on water is scanned as a 75-dpi PICT image and opened in FreeHand, where it serves as a template for tracing with the corner and curve tools.

2 Adding Solids and Gradations



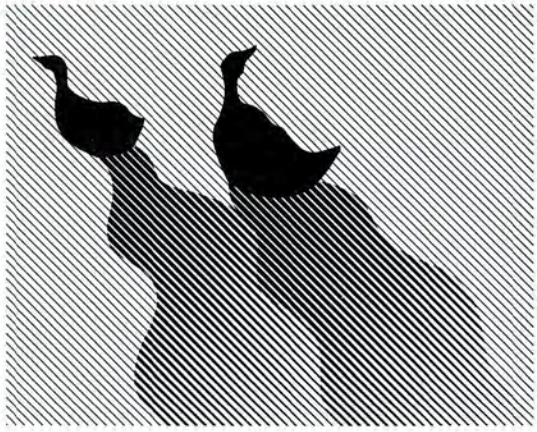
Basic fills of black and 10-percent black are added to the ducks and background, respectively. Next, each wave shape is given a linear graduated fill. The fill ranges from 80- to 10-percent black at an angle of 313 degrees. (FreeHand specifies angles for graduated fills by measuring *counter-clockwise*, with 0 degrees at the *right* [east] of the compass.)

3 Specifying a Line Screen



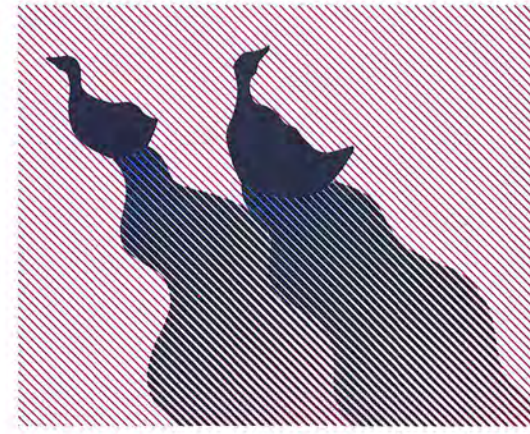
A coarse line screen specified in the Halftone Screen dialog box (accessible on the Special submenu of the Element menu) is applied to the background and wave shapes. A line screen of 30 lpi is chosen, with an angle of 135 degrees. (FreeHand measures screen angles in a *clockwise* direction, with 0 degrees at the *top* [north] of the compass.) The black fill on the ducks is left in default mode; it will print with a dot screen at a 45-degree angle, and the lpi will be optimized for the resolution of the output device.

4 Applying the Screen



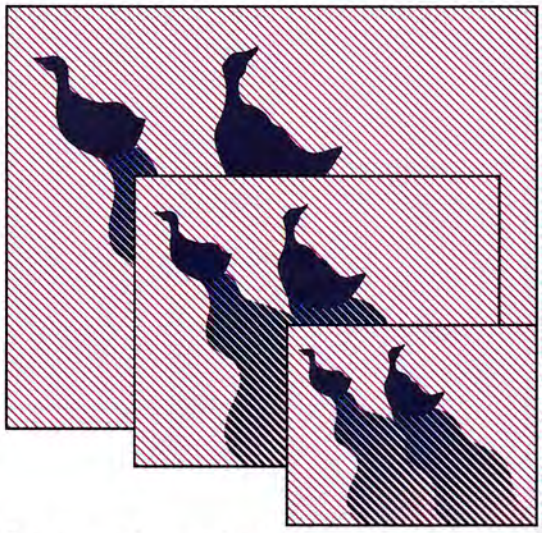
When the image is printed, the graduated fills and the background are rendered as a series of slanted parallel lines of varying thickness. Because the same screen angle is used throughout, the lines appear to travel diagonally across the entire drawing, thickening and thinning as they go.

5 Adding Color



Two process colors, mauve and dark blue, are created with the Process Color command. The background is filled with 50-percent mauve, the ducks with dark blue, and the waves with a gradation from dark blue to mauve at an angle of 313 degrees. Because the white space that appears between the screen lines is an integral part of the screen, the image is opaque and colors placed behind it will not show through.

6 Changing the Image Size



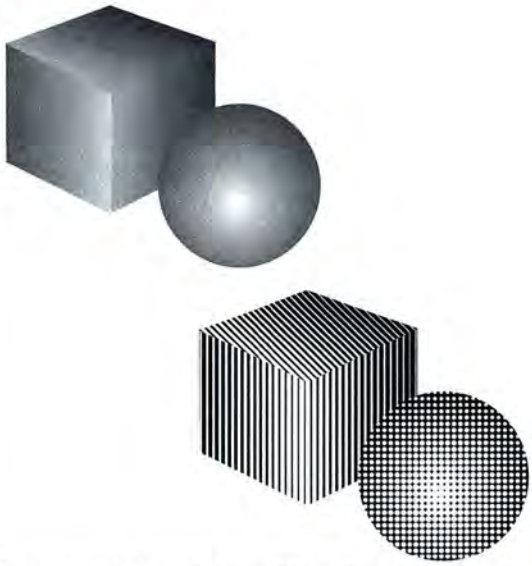
Once a screen frequency has been specified, it remains the same no matter how much the image is enlarged or reduced. The bottom two drawings have the same 30-line frequency as the top image, but the smaller the image, the larger the lines appear in relation to it. For best results, you should proof the illustration at the size it will be printed.

7 Changing the Screen Type



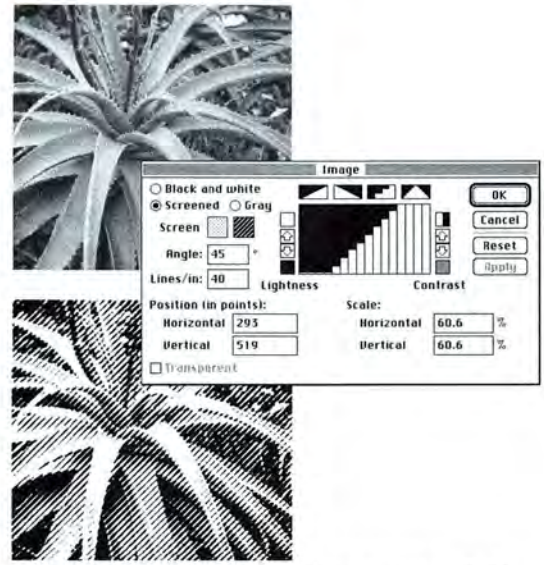
The duck drawing could also be rendered with a round-dot screen — shown here at 15 lpi with an angle of 135 degrees — but this effect isn't as well suited to the subject matter.

8 Mixing Screens



Because each element of a graphic can have its own screen characteristics, you can mix line and dot screens in a single illustration. In this illustration, a cube and a square were first shaded (top) and then assigned separate 30-line screens (bottom). Note that each side of the cube was assigned a separate graduated fill and line screen.

9 Screening a TIFF Image



FreeHand also lets you edit the halftone screens applied to imported TIFF images, such as this gray-scale scan of a cactus (top). Using the Image dialog box (accessed with the Element Info command), the artist increases the contrast and applies a line screen of 40 lpi at 45 degrees. The final image (bottom) has the look of an engraving.

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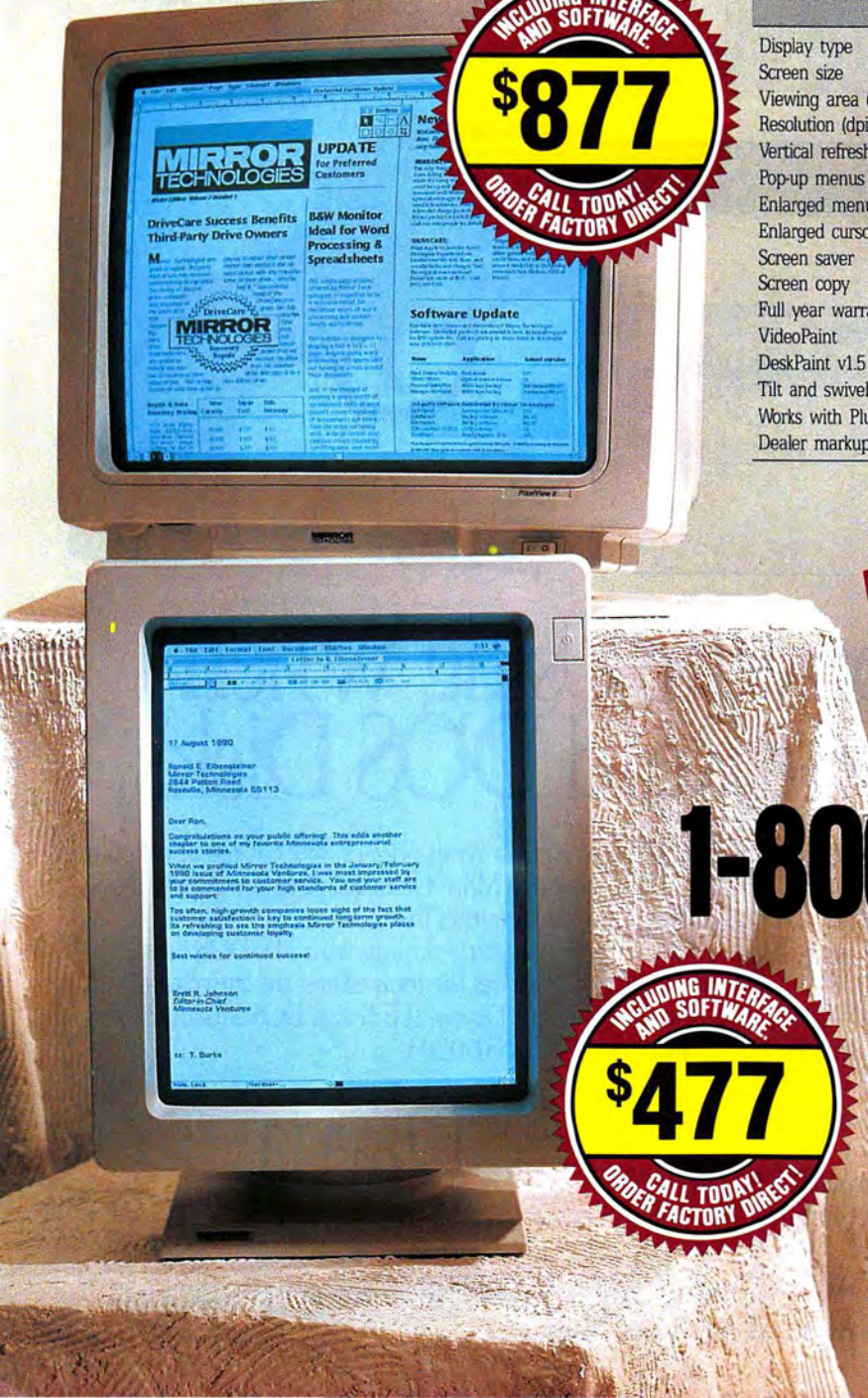
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Viewing area (sq. in.)	90.77	151.58	151.58	151.58
Resolution (dpi)	80	72	72	72
Vertical refresh	75	78	75	74
Pop-up menus	Yes	Yes	Yes	Yes
Enlarged menubar	Yes	Yes	Yes	Yes
Enlarged cursor	Yes	Yes	Yes	Yes
Screen saver	Yes	Yes	Yes	Yes
Screen copy	Yes	Yes	Yes	Yes
Full year warranty	Yes	Yes	Yes	Yes
VideoPaint	No	No	Yes	Yes
DeskPaint v1.5	Yes	Yes	No	No
Tilt and swivel	Yes	Yes	Yes	Yes
Works with Plus, SE, CLassic	Yes	Yes	No	No
Dealer markup	No	No	No	No



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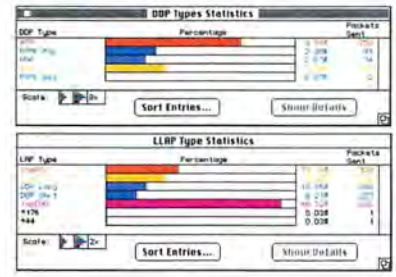
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Motorola's Altair wireless Ethernet products allow computers to communicate at Ethernet speed, using 18-gigahertz radio waves instead of wires as the communication medium. Altair can serve up to 32 users within a 5,000-square-foot area. Cost per user: anywhere from $700 on up into the thousands. However, rewiring is not *a small-ticket process, so you could break even PDQ if you use Altair in an office environment that gets reconfigured and rewired frequently.*

By Henry Bortman

Network management: First there were NetMinder Ethernet (Neon Software) and EtherPeek (The AG Group). Then there was NetMinder LocalTalk (Neon again). Now The AG Group is shipping LocalPeek ($495), a software-based LocalTalk-network-analysis tool that runs on the Mac. It provides a graphical view of network-traffic statistics, which most network managers will find useful, and excruciatingly detailed information about individual LocalTalk-protocol data packets, which only the most committed network nerd will find of interest. Contact The AG Group at (415) 937-7900.



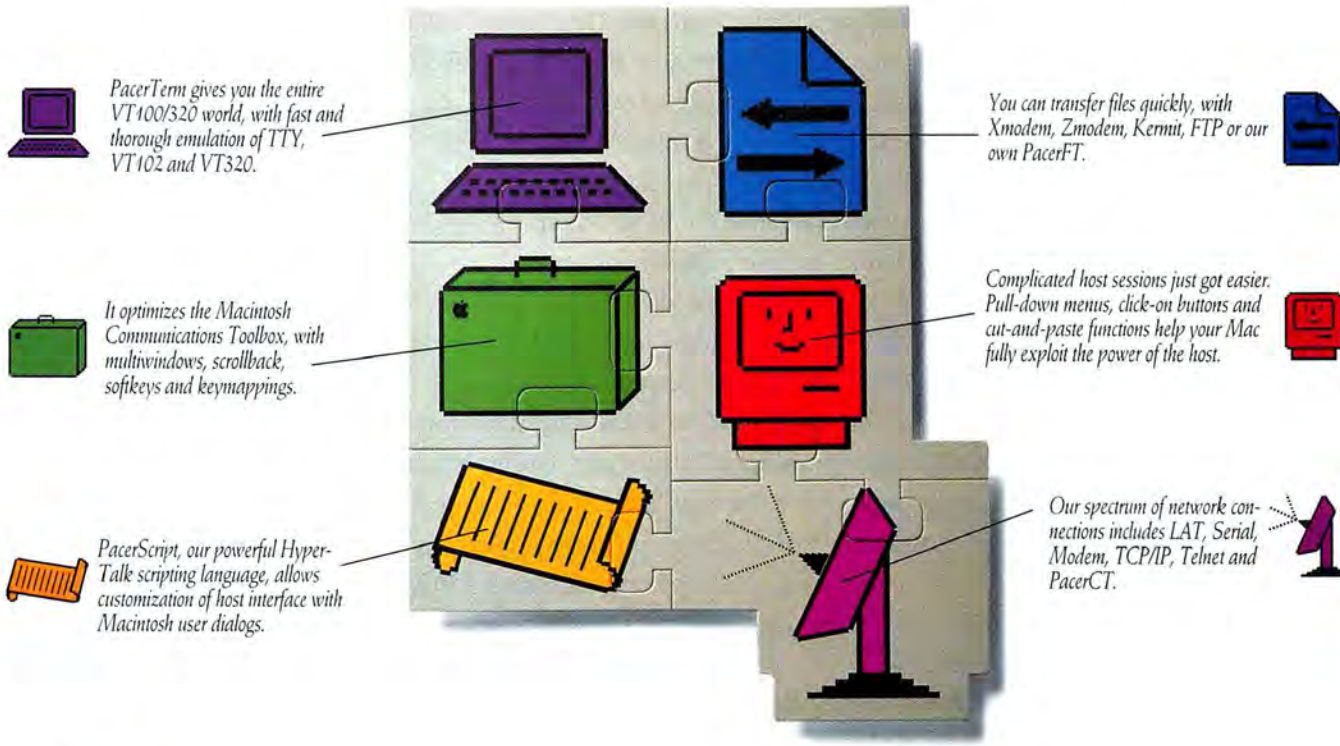
Meanwhile, if you are among the lucky ones who have to manage an AppleTalk network and have been wondering when Apple is finally going to release its long-rumored-but-not-yet-announced AMP (its proprietary AppleTalk Management Protocol), don't hold your breath. There's a new rumor: Apple has apparently scrapped AMP in favor of SNMP (Simple Network Management Protocol), which is already in widespread use in TCP/IP networks.

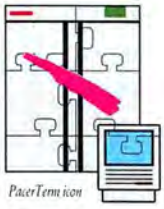
Novell again: It just can't seem to stay out of the news. And why should it? Even IBM wants to license NetWare these days. But wait — isn't IBM the one that hired Microsoft to do LAN Manager, the technology at the core of IBM's LAN Server? Uh-huh, and now IBM is going to market and support NetWare as well. Look for NetWare servers running on OS/2 and AIX systems, plus client software for DOS and OS/2 desktop machines that will let a user log in to a Novell NetWare server and an IBM LAN Server with a single log-in. You know, we get so used to expecting network-product vendors *not* to listen when we say we want seamless interoperability that we're not sure *what* to think when they finally say they *are* going to provide it.

A new way to look at data: Oracle's OracleCard ($299) is a full-color HyperCard-like front end for Oracle databases. You can use the stacks provided for creating and querying database tables and use the rich stack-building environment to construct your own custom front-end applications for accessing and editing data on Oracle servers. With OracleCard, draw and paint images can be stored as data on Oracle servers and displayed within OracleCard stacks. Look for Mac and Windows 3.0 versions in the second quarter of '91, with Presentation Manager, OPEN LOOK, Motif, and NeXTStep versions to follow.



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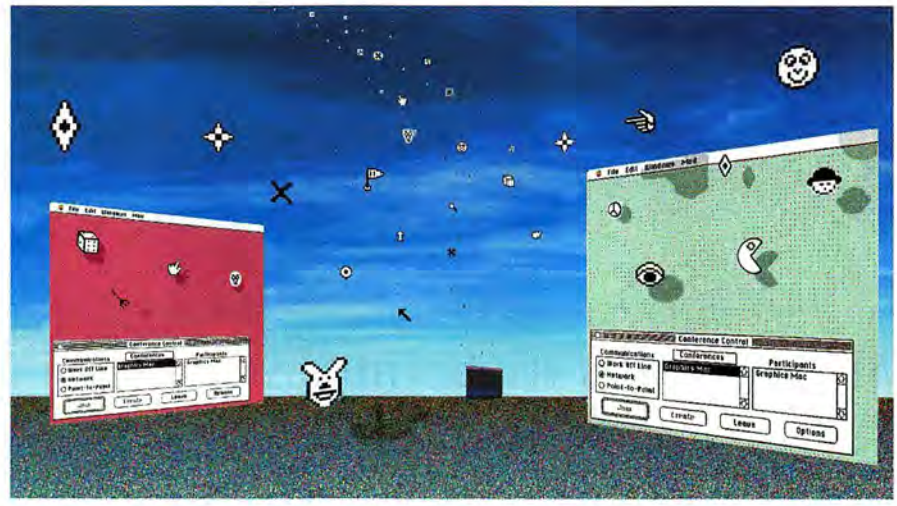
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Groupware Grows Up

Group Technologies' Aspects is the first real groupware product for the Mac. Is it the forerunner of things to come?

By Victoria von Biel



The time is right for groupware. Network-based applications that allow several users to work on the same document at the same time are hot news, and the release of System 7.0 will only make users hungrier for — and more aware of — such applications. In fact, System 7.0 promises to make the seductive idea of collaborative computing a reality rather than a marketing phrase. The new System's file-sharing capabilities will make access to other Macs across a network incredibly simple; combined with publish-and-subscribe, they will let users quickly access a file, make changes, and have those changes instantly reflected in other users' copies anywhere on the network.

But what seems to have really pushed groupware into maturity is the release of Group Technologies' Aspects 1.0. Aspects lets 2 to 16 users on a network not only *work* on a document at the same time but also *see* each other's changes *as they happen* (see Figure 1). It's the kind of deceptively simple-looking product that makes the most of the Mac's interface and easy networkability. It's also the first true groupware product.

Aspects came on the scene when it looked as though groupware was going nowhere fast. In October 1990, when Aspects was released, the only real groupware was multiuser database programs, such as ACIUS' 4th Dimension, and a handful of products for tasks such as group editing.

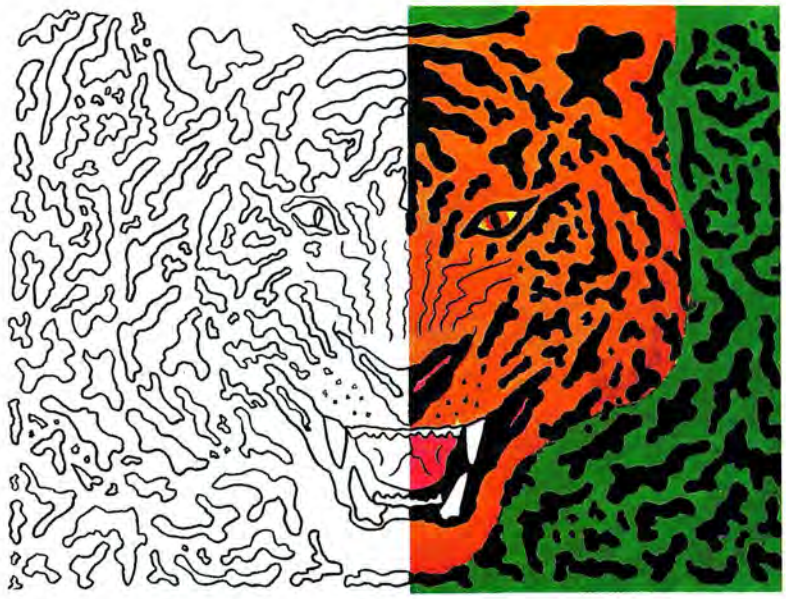
One groupware pioneer is Mainstay, whose MarkUp was the first group-editing product for the Mac. It allowed users to edit and annotate documents across a network and then compile the changes. A newer Mainstay product, Marco Polo, lets users archive documents on a server volume. By and large, however, there haven't been many groupware products, nor has there been a product that allows users to collaboratively work on a document at the same time.

Enter Aspects. Although by no means perfect, it does lay the groundwork for groupware developments to come.

Why has this technology taken so long to come to the Mac? Imagine the difficulties of developing a network-based application, and then multiply those difficulties a hundredfold. You don't just need to come up with an intuitive interface but you must also develop one that lets several people log in to a session easily and quickly. It must also let users make changes simultaneously — and without chaos. You don't just need to develop an application that can send each participant's changes across the network but you must also develop one that sends those changes so quickly and seamlessly that they don't interrupt the work flow. Group Technologies was able to address these problems and come up with solutions that work (some better than others, however).

Meeting on a Mac

To visualize how Aspects works, imagine that you want to have a meeting with some of your colleagues to show them a marketing plan you've sketched out on your Mac. You could distribute hard copies, hold a meeting, brainstorm, and then add any changes to your own electronic copy. Or you could give everyone an electronic copy across a network



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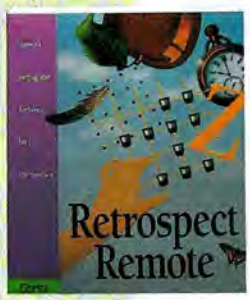
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and assimilate their changes in a master file. With Aspects, however, you bypass these steps and hold your meeting on-line. When you set up the meeting, each person on the network who is going to participate receives an identical working copy of the word-processing, draw, or paint document. The changes each person makes are immediately visible to the other participants. During the meeting, you can discuss the document via a conference call or — if telephone contact is inconvenient or impossible — via a "chat box" on-screen. As the person who set up the meeting, you get to decide who can participate in the conference and to what extent each person can comment on or alter the document in question. Members of the meeting can even work on different documents. When the meeting's over, each person has a copy of the document with everyone's input included.

In order to make such a scenario work, Group Technologies had to rethink how documents and the changes made to them are sent across a network. When a meeting starts, documents are sent to participants and loaded into the RAM of each Mac. Depending on the size of the document you're sending, this can take some time. However, once the document has been loaded, Aspects uses a proprietary communications protocol to send *only* the changes — not the entire revised document — across the network or modem lines. As a result, the document updates almost instantaneously each time a change is made.

Participants in the conference can be on an AppleTalk-compatible network (LocalTalk, Ethernet, or token ring), or two participants can use Aspects over a modem line (2,400 bps is the recommended minimum transmission rate, but if you don't mind slow file transfer, you can use 1,200 bps). By using software such as Shiva's Dial-In Network Access, a remote user can call in to a network and appear to other participants as a node on that network.

Aspects has three native formats — a word processor, a drawing program, and a painting program. You can create documents off-line in these native formats or import files from Microsoft Word (versions 3.0 and 4.0); MacWrite II and MacWrite II 5.0; and ASCII, PICT, and MacPaint files. One of Aspects' major shortcomings is its lack of a spreadsheet program or outliner (and you can't import spreadsheets or outlines into Aspects with their functionality intact).

The number of documents you bring

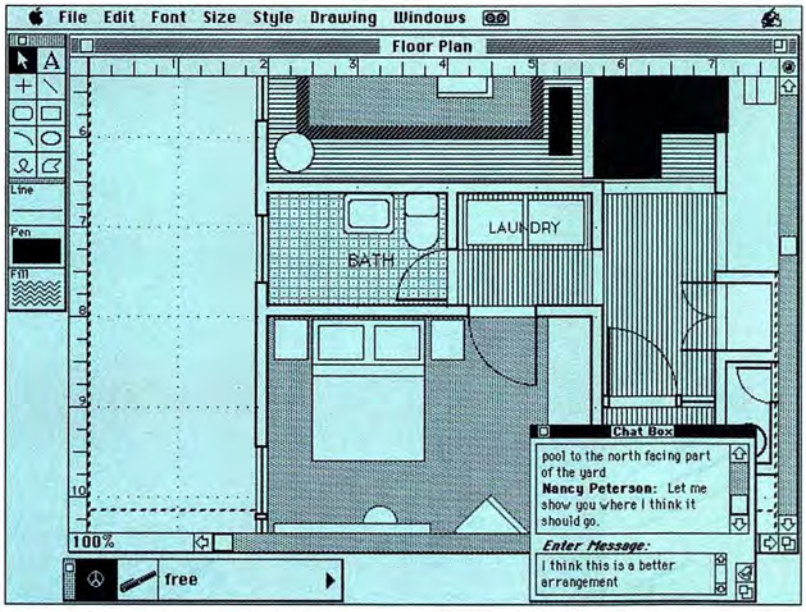


Figure 1: Using Aspects, a group of people on a network can edit the same document and see each other's changes in real time. A conference call is the easiest way to discuss the document while you work, but if that's not possible, you can use the "chat box," which lets you talk interactively on-screen.



Figure 2: The person who starts a meeting becomes the moderator and has responsibility for deciding to what extent participants can edit a document and who will be allowed to join the meeting.

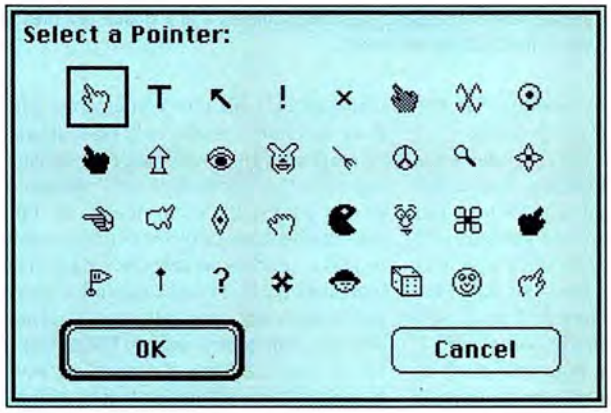


Figure 3: To avoid the confusion of numerous identical pointers on-screen, each participant can choose a unique pointer.



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Figure 4: Aspects in Action

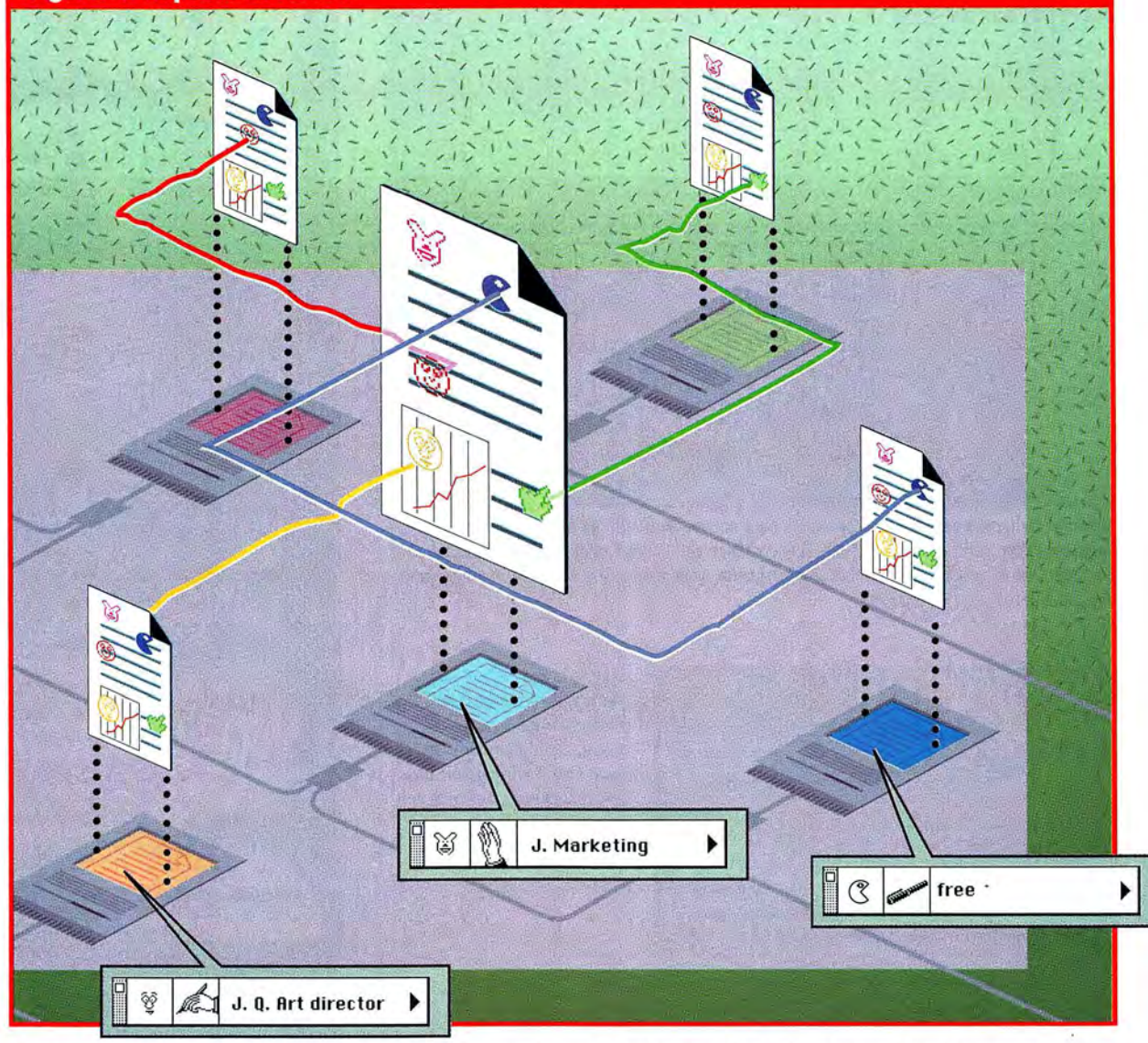


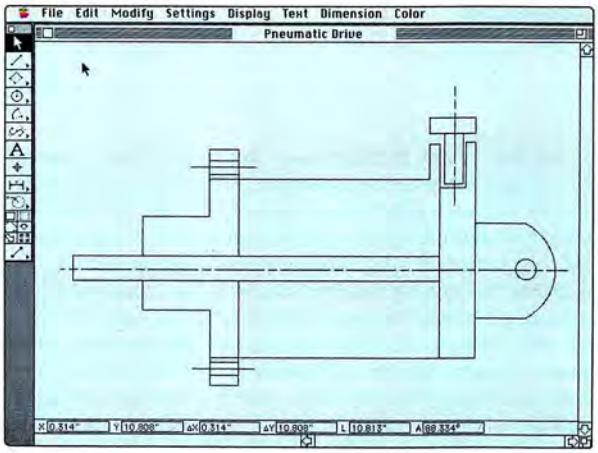
Figure 4: Using Aspects, up to 16 people on a network (or 2 people connected by modem) can see and work on the same document at the same time. A series of icons lets users know whether or not they can edit the document: A raised hand means it's not yet your turn to edit, a pen-in-hand icon means you can go ahead, and a closed pen means you cannot edit the document.

into a meeting depends on available RAM: Aspects can work with 1 megabyte, but what you can do is limited. To work with several documents and use the full painting and drawing capabilities, you should devote at least 1 megabyte of MultiFinder memory to the application alone.

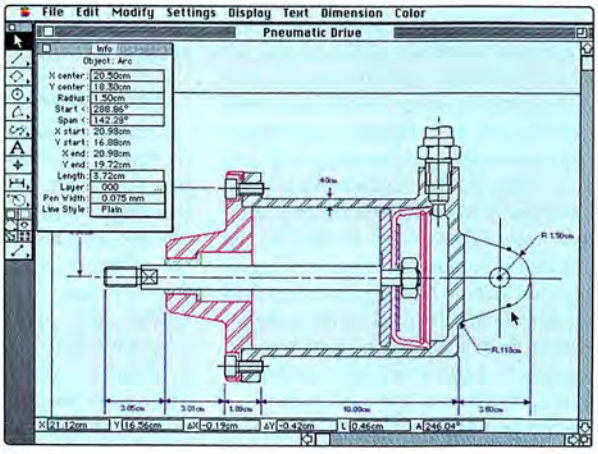
Master of Ceremonies

The person who starts a meeting becomes, by default, the conference moderator, with responsibility for keeping the proceedings running smoothly. (If the moderator leaves the conference — whether intentionally or not — the conference doesn't end; the next person on the network is automatically chosen to be the moderator.) The moderator chooses one of three mediation levels with which to conduct the meeting: Free For All, Medium, and Full (see Figure 2). Free-for-all mediation lets all participants edit a document at the same time; this mode is essentially for brainstorming or informal conferences with few participants. Medium mediation allows only one editor at a time per document, although participants can edit other documents while someone else is editing the main document. Full mediation allows only one editor at a time to make changes to *any* document. The moderator decides who can edit a document and assigns edit control to users (and can also take edit control away). The moderator chooses the level of security as well: You can allow participants to join without

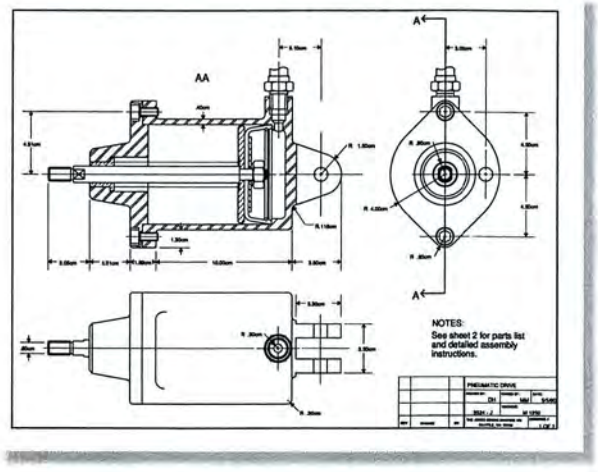
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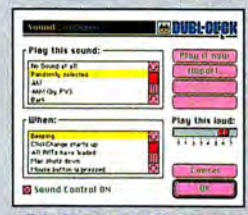
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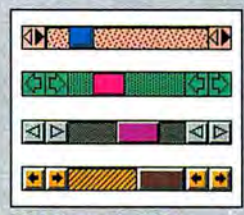
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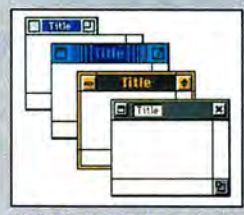
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any barriers, require that they use a password to gain access to the conference, or stipulate that each person who wants to join the conference first receive permission.

Having more than one person editing a document can quickly become chaotic. Aspects gets around this problem in several ways. First, it allows participants to choose a unique pointer to show other participants areas of interest on the screen (see Figure 3). Unfortunately, there's no way to tell which pointer belongs to whom, so it can get confusing.

To avoid conflicts when you're working on a word-processing document — for example, entering or editing text — the program shows other participants your insertion point as a gray line and prevents them from working in that paragraph until you've finished. In the Draw mode, the object you're working on is inalterable by other users. There is no locking in the Paint mode, because users are working on a bit level and it's unlikely that more than one user would try to work on the same bit. Because there is no locking in this mode, however, you can avoid some confusion by using medium or full mediation.

When you're working with full or medium mediation, icons appear in a bar at the bottom of the screen to let you know whether or not you can edit the document. An upraised hand tells you it's not yet your turn to edit, a pen-in-hand icon means you can go ahead, and a closed pen means you cannot edit the document. To request edit control, you click on the closed pen (see Figure 4).

Pros and Cons

Aspects' native formats offer only a basic feature set — Group Technologies obviously put its efforts into solving the technological and interface problems of the product rather than into adding frills. This bread-and-butter approach is adequate for initial brainstorming work, but when combined with Aspects' limited import capabilities, it can be a real drawback. For example, you can't use Aspects to edit documents created in a page-layout program or final versions of files that include sophisticated formatting. Another limitation is that Aspects supports only black-and-white graphics, so you can't use it to demo or brainstorm a document, such as a color presentation, that relies on gray scale or color for its effect. In addition, Aspects' lack of a spreadsheet program or outliner seems to knock out a lot of potential business users. Until these problems are addressed, Aspects' main use will be as a brainstorming tool.

On the plus side, Aspects has an easy-to-use and intuitive interface that seldom gets in the way of the business at hand. Joining a conference is extremely simple: Just open the application; select whether you want to work off-line, point-to-point (via modem), or on the network; and double-click on the meeting you wish to join. To edit a document, you select the tool you want to use from a tool palette, and then proceed as normal. Changes in the mediation status or moderator are announced via dialog boxes.

The Future's in Sight

Despite its limitations, Aspects takes the first leap into the kind of intuitive, real-time groupware realm that we should soon be seeing more of. The real question is where Group Technologies will choose to go with the product. One option would be for it to expand Aspects' scope by beefing up the native applications and allowing users to import a much wider variety of applications. Another scenario — and one that is more likely to produce well-crafted, productive applications — would be for the company to license the technology to third parties, who would then create their own specialized applications.

As for the future of groupware, a natural progression seems to be into the area of multimedia, by allowing users to include multiple voice annotations with their work, for example. Whatever happens, we're bound to see more-sophisticated groupware in the next few years.

Get Info

Aspects

★★★★

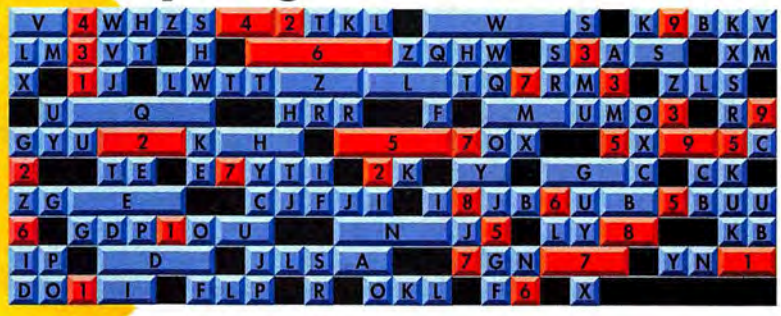
Published by: Group Technologies, 1408 N. Fillmore Street, Suite 10, Arlington, VA 22201; (703) 528-1555.

List Price: Single-user package, $299; five-user package, $895; ten-user package, $1,295.

Comments: Aspects 1.0 lets 2 to 16 users on a network (or 2 users connected by modem) simultaneously work on a document and see each other's changes. It was the winner of the 1990 *MacUser* Editors' Choice Award for best work-group product.

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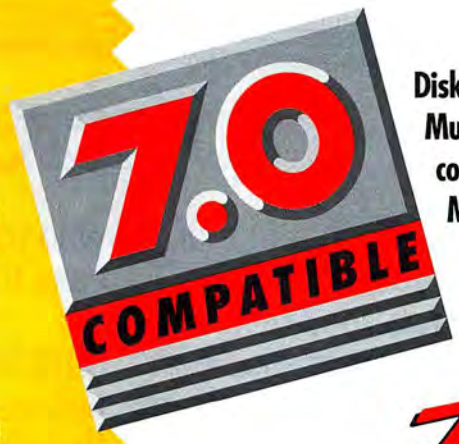
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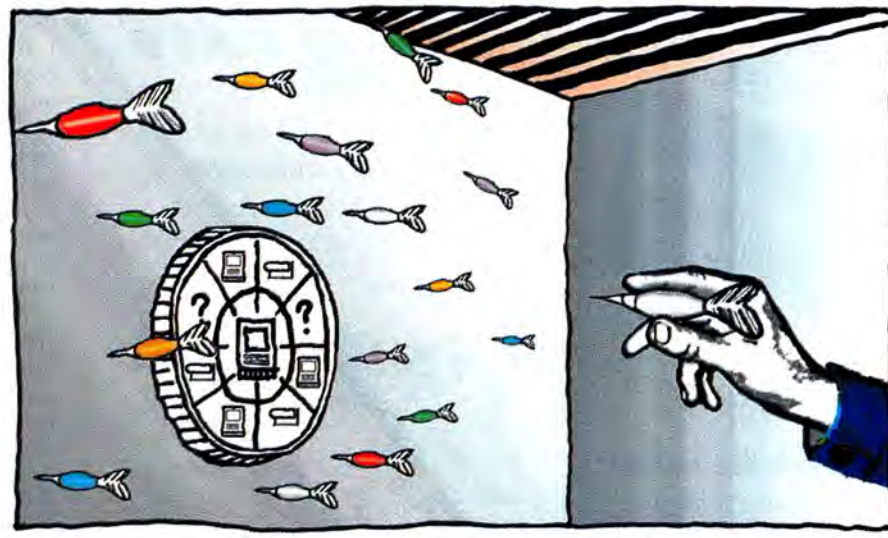
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The Hit-or-Miss Method

Sometimes a random approach to troubleshooting a network actually does the trick.

By Kurt VanderSluis



Troubleshooting can frequently be an orderly process. You methodically work your way through the network setup, locate the problem, and correct it. Other times, you just randomly try things and hope something works to get rid of the problem. For example, if your Mac is crashing a lot, you might try reinstalling the System software. If this works, you probably won't know what the problem was, but at least it's gone.

Here's a list of ten analogous things to try for problem solving on a network. These are not in any particular order, because there is no logical order to these activities.

1. If the problem appears to be somewhere on the network, try cycling the power on network devices such as routers, star hubs, and network modems. Turn the device off, leave it off for 30 seconds, and then turn it back on. If the problem goes away, it's possible that the device or its software got "hung"—the device received an instruction it couldn't process or ignore. Restarting the device clears that instruction and starts the device from scratch. Be sure no one is using the device before you cycle the power, however. Sometimes you may be having a problem with a particular device, but a coworker is using it just fine.

2. If your Mac appears to be the source of the networking problem, use the Chooser to turn AppleTalk off and then back on again or, more drastically, restart the computer. If you have more than one network driver, try switching to a different one. For example, if you're connected simultaneously to Ethernet and LocalTalk, you can momentarily choose the alternative network with the Network cdev and then switch back to your regular network choice. This forces your Mac to join the first network all over again and realert other devices of its presence.

3. Turn off all your INITs with Aask or INITPicker (or remove them all from your System Folder), and restart your Mac. INIT conflicts are tricky and unpredictable, and few people understand why they cause problems. If the problem goes away after you've turned off the INITs and rebooted, then it probably is an INIT conflict of some kind. Try turning the INITs back on, one by one; this may help you discover which one is the culprit. If you find the problem INIT and you really must use it, try renaming it so that it loads in a different order (for example, adding ~ in front of the name will force it to load last). Be careful, though; some INITs don't work properly if they're renamed.

4. Check for viruses on the file servers and on your Mac. If you use a commercial virus checker such as Symantec's SAM or Mainstay's Virex, make sure you have the latest version and the latest virus information. If you have a shareware or freeware checker such as Disinfectant, check the bulletin boards or commercial on-line services to find out about your favorite's latest release. Viruses don't usually cause network problems (although they can be transmitted over a network), but it's worth a try.

5. Reload the software in network devices such as hubs, routers, gateways, and servers. Reenter the configuration information, making sure it is exactly what you want and is

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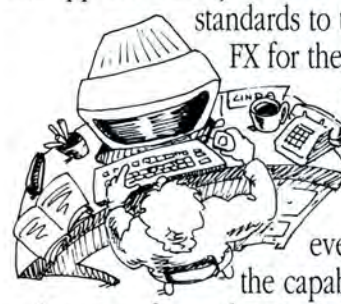
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MacUser MEANS BUSINESS

COMING IN AUGUST:

THE WONDERFUL WORLD OF WORKSTATIONS

This August, The MacUser Labs examines 4 major workstations — and applies industry workstation standards to the Mac FX for the first time. Will the FX ever have the capabilities and power of a workstation? Will workstations ever be as easy to use as a Mac? Find out in this sizzling August issue.



NETWORK BACKUP MOVES FORWARD

Dependable backup solutions are more than important — they're crucial. In this report, the MacUser experts look at unattended backup systems over the network, and test software/hardware configurations for backup solutions. Don't miss out.



AD CLOSE: Wednesday, May 29, 1991

TROUBLE SHOTS

compatible with the other devices in your internet. It's possible that a colleague changed the software or configuration tables without your knowledge and misconfigured them, or perhaps you've misconfigured them yourself.

6. Swap out the various devices, cables, connectors, and network cards on your machine and across the network. Do this one component at a time, and see if anything changes. Usually if cables or connectors are bad, they will be bad right out of the box, but sometimes they go bad while in service. Maybe a forklift ran over your network wires, lightning struck the building, or something wiggled loose.

7. If you use Ethernet or a token-ring configuration, reinstall your network software or reconfigure your workstations' network information. If you have an older Mac, you may need to patch its ROM by running a newer version of AppleTalk (version 53 is the most recent) or you may need to put the ADSP (AppleTalk Data Stream Protocol) patch file into your System Folder (this file comes with some network products).

8. Remove your password from the server, or reconfigure your user information with the administrator software that comes with your server. Maybe you typed the password incorrectly. Also, passwords are usually case-sensitive, so be sure you're not typing in your password with the Caps Lock key down.

9. Try adding more RAM to your machine (or the server) or using the Finder instead of MultiFinder. Use CE Software's HeapFixer to increase the size of your system's heap space. Do the same for the server if necessary. If your central workstation is running more than one network service (such as file-server, mail-server, *and* print-spooler software), try placing the services on different machines or disabling one of them temporarily.

10. Try reading the manual, even if you've read it before. It's weird, but sometimes while you're having a problem, you open the manual and see an obscure passage you've never noticed before or didn't understand. This has happened to me more than once.

I'm not recommending the random method as your usual troubleshooting approach, but there *are* times when it does the job. However, if you're having network problems more than twice a month, you should investigate further, using a more systematic approach and more-traditional troubleshooting tools.

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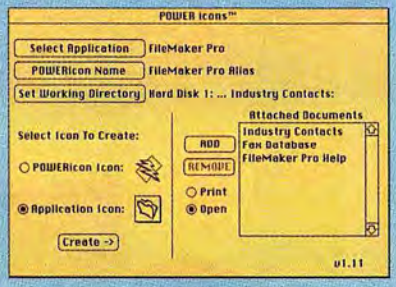
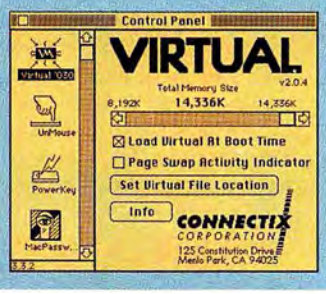
Here's how to get the best features of System 7.0 while still running System 6.x.

By Ross Scott Rubin

System 7.0 is hot, but it'll leave a few users out in the cold for some time to come. The 2-megabyte RAM requirement isn't such a big deal, but potential compatibility concerns and the inevitable bugs of a first release may make some people opt to stay with trusty old System 6.x a little longer. So does this mean that System 6.x users are doomed to life without any of System 7.0's snazzy new features? Not necessarily. There are plenty of products that can give System 6.x users some of System 7.0's capabilities (see "70 Things You Need to Know About System 7.0" elsewhere in this issue for a full description of System 7.0). These products can't claim System 7.0's level of integration, but they do let you pick just those features you want to use.

For example, several commonly used utilities duplicate some of Finder 7.0's most convenient features. CE Software's DiskTop or Fifth Generation Systems' DiskTools, a component of File Director, have find capabilities

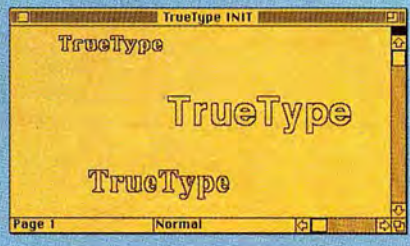
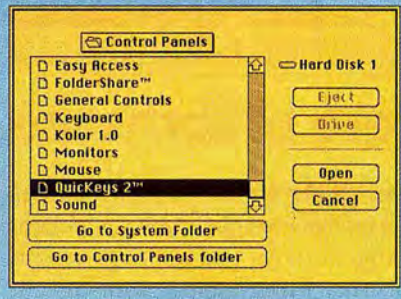
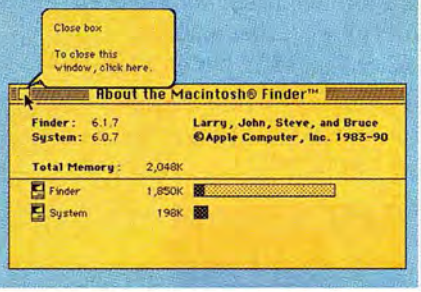
Table 1: Six Ways to Live Without System 7.0

System 7.0 Feature	System 6.x Solution	What You Get
1. Aliases 	**POWERicons** (Magic Software, $49.95) **Tiles** (CE Software, $99.95)	Like System 7.0's aliases, POWERicons lets you "clone" an application's icon. You can place the clone on the desktop or in a project folder for easy access while the original application stays in its own folder. Like System 7.0 aliases, these icons simply provide a path to the original application. Tiles, which was in beta as we went to press but which should be available when you read this, works a little differently. It keeps track of which applications you use and then generates "tiles" representing those applications. You can drag the tiles anywhere on the screen. You can automate your work by combining application tiles and related documents in project tiles that you can access instantly with a QuicKeys 2 key combination.
2. File sharing 	**allShare** (EveryWare, $249 per zone) **EasyShare** (Symmetry Software, $99.95 per ten-user server)	EasyShare (an INIT/DA) and allShare (a cdev) are easy-to-use products that let you share files without using an AppleShare server. Both utilities use the Chooser for retrieving files from other Macs, and both let you set access levels and add password protection. Like file sharing under System 7.0, both of these products work best with small, Mac-only networks. Unlike the System 7.0 feature, however, they run into problems if two client Macs log on to each other's shared folders.
3. Memory 	**Virtual** (Connectix, $199) **Maxima** (Connectix, $129) **Optima/32** (Connectix, $269)	A trio of products from Connectix gives System 6.x users some of System 7.0's expanded-memory capabilities. Virtual is an INIT that lets a 68030 Mac use up to 14 megabytes of virtual memory. It needs 14 megabytes of contiguous free space on your hard disk, so you may need to defragment your hard disk before installing it. Maxima lets you get around the Mac's 8-megabyte RAM limitation: You can have up to 32 megabytes of RAM installed, with 8 to 14 megabytes used for applications and the remainder for creating a speedy RAM disk that is backed up automatically when the Mac shuts down. If you have a Mac with 32-bit-clean ROMs (a IIci, IIsi, or IIfx), Optima/32 lets you use all available RAM—up to 128 megabytes—without forcing you to set some aside for a RAM disk.

as good as — if not better than — System 7.0's. Connectix's HandOff II and Icom Simulations' On Cue give you convenient options for launching documents. MultiMaster, a component of Now Utilities, from Now Software, lets you hide applications under MultiFinder. And KiwiFinderExtender, from Kiwi Software, lets you assign to files keywords that you can use like System 7.0's Labels for searching or organization.

There are even products that let you mimic System 7.0's look. Dubl-Click Software's ClickChange is a cdev that lets you customize your Mac's scroll bars, windows, cursors, buttons, and colors to look like those of System 7.0. Icon Colorizer and SunDesk are INITs (available from Zmac and other freeware sources) that use the icl8 resources contained in color icons to display multicolored icons in the Finder and dialog boxes the same way that System 7.0 does. Most new programs already include these resources, and on-line services such as America Online and Zmac provide a steady stream of color-icon resources for older programs.

Table 1 lists six of System 7.0's features and suggests how you can duplicate them under System 6.x. Using all these alternatives isn't inexpensive, but it will give you a taste of what you're missing.

System 7.0 Feature	System 6.x Solution	What You Get
4. TrueType 	**TrueType INIT** (Apple, free) **Adobe Type Manager** (Adobe Systems, $99)	TrueType promises System 7.0 users scalable outline fonts that look sharp at any size, whether on-screen or in print. Apple is distributing a TrueType INIT for System 6.0.7 users through dealers, user groups, and on-line services. But even if you use an earlier version of System 6, you can get scalable fonts by using Adobe Type Manager. ATM uses PostScript for smooth fonts on-screen and when printed from QuickDraw printers.
5. Control Panels 	**GooPanel** (Freeware; available from sources such as Zmac, *MacUser*'s on-line service)	GooPanel is a combination application and INIT that lets you bypass the Control Panel DA and open multiple cdevs from the Finder. Although not quite as convenient as System 7.0's Control Panels — you can't just double-click on an icon — GooPanel does provide shortcuts to the System Folder or Control Panels folder that contains your cdevs.
6. Balloon help 	**Balloon Helper** (Olduvai; price unavailable at press time)	As we went to press, Olduvai announced that it was developing Balloon Helper, an INIT that tricks System 7.0-ready applications into showing their balloon help under System 6.x by substituting for System 7.0's new Help Manager. Olduvai also plans to include balloon sets for popular applications such as Excel 2.2 that don't have balloon help, as well as a tool that will let nondevelopers create their own help balloons.



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Keyboard Care and Feeding

The keyboard is the Rodney Dangerfield of the Mac — it doesn't get much respect, and it takes a lot of abuse.

By Thom Hogan



This month's subject is keyboards, which are generally taken for granted by the majority of Mac users. You get one when you buy your machine, and then you pretty much forget it. Mice, on the other hand, get lots of respect. Indeed, the mouse is held in such high esteem that many analysts have decreed that the mouse is the component that sets the Mac apart from its computer brethren, and *MacUser* uses it as a symbol of product quality (*Did it get five mice? No? Well* forget *it, then*). And unless you buy a Classic or LC, you even have to pay for the keyboard, whereas the mouse comes free with every Mac. Several companies have made fortunes selling mice — better mice, faster mice, upside-down mice (also known as trackballs), mouse alternatives (such as tablets and touch screens), and who knows what else. The few companies hawking keyboards seem to have no selling point other than that *their* keyboards are less expensive than the ones sold by Apple.

So I'm here to praise keyboards, not to bury them. You can consider this a minitutorial on the subject.

Your First Keyboard

The problem you face when buying a keyboard is that there really isn't much choice. If the dealer sticks by the Apple party line, you can choose between the big (extended) keyboard and the small (standard) one. If your dealer is more than an Apple pusher, you may find six or more keyboards — but they all look the same. Buying a keyboard is not unlike buying tires for your car: It's an indispensable part of the equipment, but they all look alike, even though some work quite differently than others. I've used many of the keyboards available today; here's my encapsulated opinion of the ones I've tried.

Apple has two keyboards. The Standard keyboard ($129) is the smallest and least expensive keyboard I've used, so it's good if you don't have a lot of room or money. It also has the fewest keys — 81 — which means that you don't have the luxury of function keys or special cursor-control keys, such as Page Up and Page Down. The Extended II keyboard ($229) has a particularly good layout, and its 105 keys give you all the extras: 15 function keys, cursor-control keys, and Delete and Enter keys. Adjustable feet let you change the keyboard's angle.

DataDesk International also offers several keyboards. The Mac-101 ($194) is similar to Apple's extended keyboard. It has 101 keys, including 15 function keys, and offers a macro-making utility. This is often the lowest-priced keyboard available from mail-order companies. The Switchboard (base model, $239) is a configurable keyboard that lets you mix and match keypads, trackballs, and other accessories. You can use it with PCs as well as Macs. It's a nifty idea but a bit pricey if all you want is an extended-keyboard replacement. It has a good touch but looks clunky, and the trackball component is a little too small to be



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Buying a keyboard is not unlike buying tires for your car: It's an indispensable part of the equipment, but they all look alike, even though some work quite differently than others.

convenient. It comes with CE Software's QuicKeys 2.

Northgate Computer Systems produces the OmniMac Ultra ($99), which has a PC-like layout and 119 keys. It includes shifted function keys, making it suitable for macro lovers. I find the key operation noisy. If you want this keyboard, get one soon — it's being discontinued.

Key Tronic's MacPro Plus ($197) lets you adjust the keyboard's response by putting rubber bumpers under the keys. It has 105 keys in virtually the same layout as that of the Apple Extended II keyboard. It comes with Affinity Microsystem's Tempo II.

My recommendation? Buy one of Apple's keyboards, unless you need a specific feature offered by another keyboard (modularity, for example) or you're extremely persnickety about key touch.

Using a Keyboard

Most people buy an extended keyboard, one with all the function keys. Then they tend to ignore these keys (for a guided tour of the extended keyboard, see "Extended Keyboard Secrets," March '91, page 224). This is a big mistake, because function keys can speed up your work and boost productivity.

When you're inputting data and your hand is on the mouse, you shouldn't move it from the mouse unless absolutely necessary. Likewise, when your hands are on the keyboard, you don't want to move them from there either. Moreover, if you're trying to be really efficient and you're touch-typing, you shouldn't move your hands from the home-row positions (*a, s, d, f* for the left hand and *j, k, l, ;* for the right) unless absolutely necessary.

Although the Apple extended keyboard has preassigned keys (F1 through F4) that let you undo, cut, copy, and paste with the touch of a key, most of us still use keyboard command equivalents (such as Command-V for paste). The old PC keyboards had it right: The ten function keys were arranged in two rows on the left side of the main keyboard, making it possible to touch-type a function key (and move only one hand from its home position). Good programs facilitated this idea by making the left row of function keys control things to the left (delete word left, for example) and the right row do things to the right. With function keys spaced in blocks of four across the top as they are on the Apple extended keyboard, it's much harder to use them if you touch-type.

Nevertheless, you should be using function keys. Here's how. Right-handed people have their right hand on the mouse most of the time (lefties just have to reverse their mental picture here). That leaves the left hand free to press function keys. The trick is to assign functions to the F1 through F15 keys that are complementary to *mouse* use, not key entry. For example, let's say you're using a drawing program. You're obviously spending much of your time using the mouse to select and move objects, after which you usually apply a command to the selected objects (Bring to Front and Send to Back, for example). You can assign these commands to adjacent function keys (F13 for Bring to Front, F14 for Snap to Guides, F15 for Send to Back, for example). By putting related keys together, it's easier to remember them and position your hand in one place while keeping your eyes on the screen.

Meet Your MacroMaker

So how do you go about assigning commands to function keys? Numerous macro utilities are available (Tempo II and QuicKeys 2, for example), but I like MacroMaker, a utility that comes free with System 6.x software and that has been thoroughly — and undeservedly — ignored. No one seems to acknowledge that this little utility exists: Most users don't bother to install it, and even Apple seems to have abandoned it. (Once when I was demonstrating something at Apple corporate headquarters, an employee asked me what that little tape icon in the menu bar was all about — it was MacroMaker.)

With MacroMaker installed, it takes about ten seconds to assign a command — or series of commands — to a key. And MacroMaker is smart enough to distinguish among applications, so you can use the same keys for different commands in different programs (more on that later). Here's a quick lesson:

1. Open the application for which you

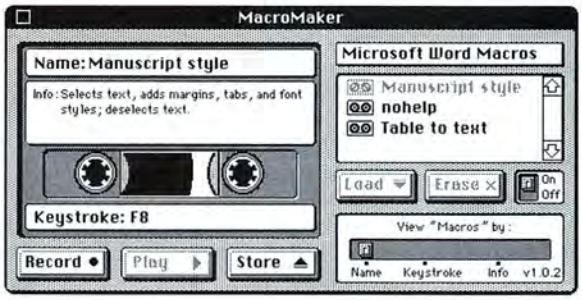


Figure 1: One of the Mac's best-kept secrets is MacroMaker, a utility included with your System software. It lets you assign elaborate command sequences to keyboard command combinations.

want to assign a function key.

2. Pull down the MacroMaker menu under the tape icon, and select Start Recording.

3. Select a command from your program (such as Send to Back).

4. Pull down the MacroMaker menu, and select Stop Recording. You'll be presented with a little dialog box in which you can annotate and assign the macro to a key. Type a name for the macro, press the Tab key, type in a description of what the macro does, press the Tab key again, and then press the key to which you want to assign the command. Click on the Store button (see Figure 1).

As I mentioned earlier, you're not limited to MacroMaker. Tempo II and QuicKeys 2 are good alternatives. Both do more than MacroMaker, but because I don't need anything as elaborate as what they provide (nor do I care to learn yet another program), MacroMaker is fine for my needs. Before using any macro utility, spend some time figuring out what processes you really need shortcuts for, and you'll be rewarded with fewer mouse-to-keyboard hand motions and higher productivity.

This brings me to the issue of having different macros for different programs. I strongly suggest that you standardize your macro-key assignments. For example, I use MacDraw, Illustrator, FreeHand, PageMaker, and QuarkXPress. All five have Bring to Front and Send to Back commands, and each program assigns these commands to different keyboard command combinations. Rather than try to remember what the combination is for any single program, I have used MacroMaker to assign these actions to function keys that remain the same from program to program.

After you've started using macros, you soon discover the sad truth that 15 function keys are often not enough (and if you don't reassign F1 to F4, there are only 11 keys). Eventually you'll have to start using the Option and Control keys in conjunction with the function keys. Unfortunately, today's keyboards were designed by people who apparently pay no attention to what their hands are doing, so using various key combinations is an exercise in digital dexterity — pianists have easier exercises to practice. (If any keyboard makers out there are aware of this problem and would like some ideas on how to fix it, drop me a note on CompuServe at 72511,140. I bet I'll hear from more users than manufacturers, however.)

Routine Maintenance

Keyboards need periodic maintenance. Once a month at a minimum, you should use a hand-held vacuum cleaner with a soft-brush attachment to suck out the nasty grit and gunk and use a damp (not wet or dripping) rag to wipe off the surface dirt. Obviously, the computer should be turned off when you do this.

But keyboards require a little more than simple cleaning from time to time. A couple of months ago, my Apple extended keyboard seemed to be dying. Every time I tried to type a capital *A* with the left Shift key, my screen would show a garble of miscellaneous characters. At first I thought the keyboard was a goner, and I switched to another one for a while.

One day I did a little exploratory surgery on the malfunctioning keyboard, and what I found was truly frightening. Hair, cookie crumbs, toxic Coke spills, and unidentifiable but undeniably ugly stuff covered every square inch of its innards. I rolled up my sleeves, put on rubber gloves, and dived in. A couple hours of vacuuming and other cleaning later (cotton swabs work well for this sort of thing), and the inside looked as I imagined it should. I put everything together and plugged it in. Out of curiosity, I tried left-Shift-A. I got an *A*!

The moral of this story is that grime doesn't pay. If you've neglected your keyboard for a long time — as I had — then the simple steps of vacuuming and



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wiping probably will not be enough. To accomplish more, you need to open up the keyboard and do some internal cleaning. For this, you need something to remove the key covers. An integrated-circuit puller — available from electronics-supply stores — works pretty well if used carefully.

A couple of hints: First, when you're removing the keys, note which ones go where. This isn't usually a problem with the main keys, but do you know where the ~ or / keys go? Second, *never* connect or disconnect the keyboard while your computer is running. The act of plugging in anything on the ADB bus while the computer is running can fry the Mac's motherboard, so shut your Mac down *before* disconnecting the keyboard. Now on to some spring cleaning:

1. Unplug the keyboard. If you have an Apple keyboard, there are several Phillips-head screws embedded in deep holes on the bottom side of the case. Remove them, and take the top lid off the case. When you're removing the lid, do it slowly and carefully and note how the ADB plugs mount at the back edge (the little circuit boards must fit in the slots just right, and you should note how they went in before you have to put them back).

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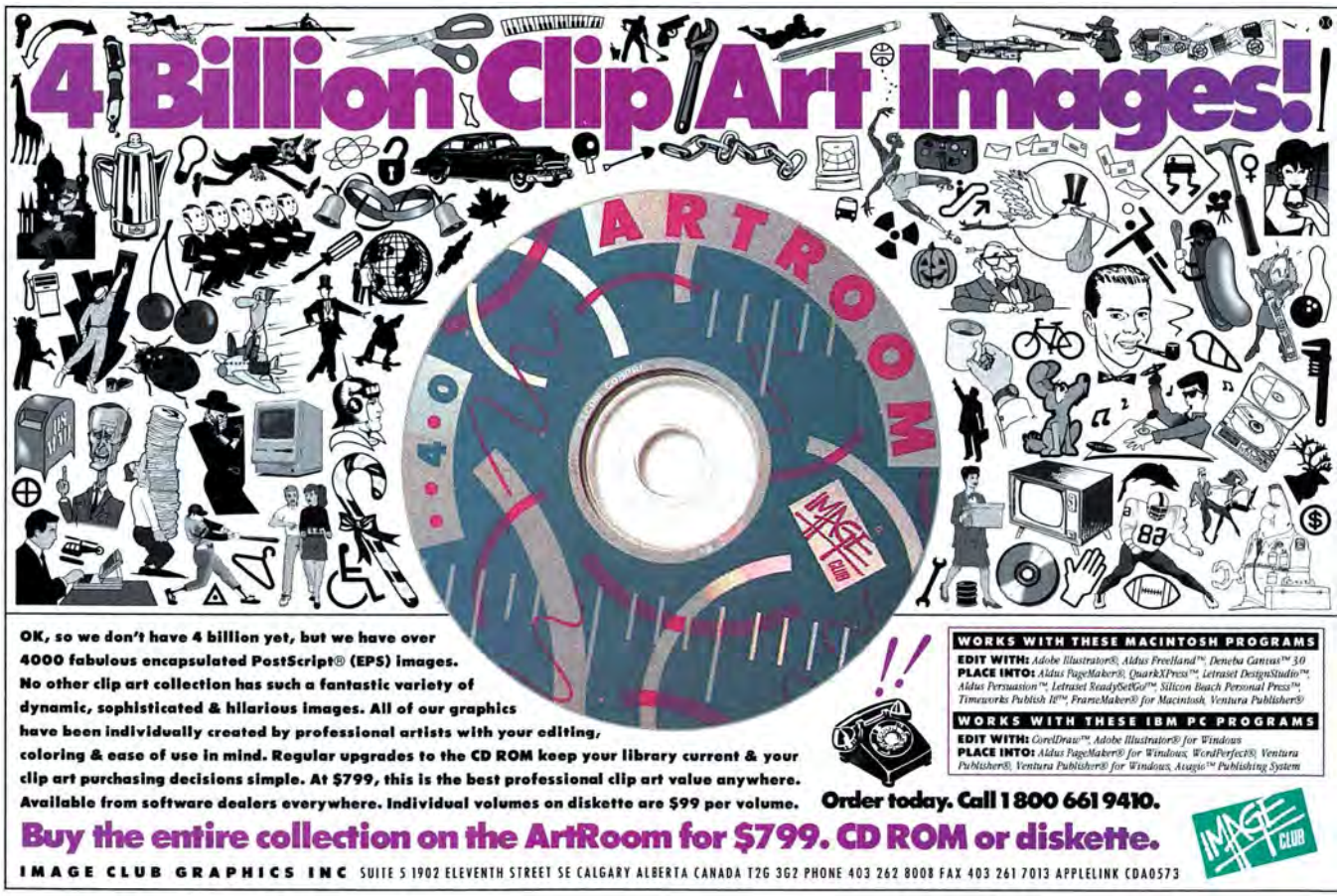
2. Remove the key covers. With most of the keys, this is a matter of pulling them straight up. Try not to pull the keys sideways while you pull up on the covers; doing so will shorten the life of the key mechanism underneath. On the large keys (space bar, Shift, Return, and so on), you'll find little metal bars underneath the keys. These pop into preassigned places on the underside of the key covers and on the key mechanism and act as springs and stiffeners. Before you remove the caps from any of the large keys, look underneath and acquaint yourself with how the bars attach. Draw a picture if necessary or take a Polaroid, because if you don't get these back the way they were, your keys will have a mushy response — or they won't work at all.

3. Use a hand-held vacuum cleaner with a soft-brush attachment to clean the inside of the unit. Try using cotton swabs on those hard-to-reach places. *Do not use water or cleaning liquids.*

4. Wash the key covers as well as the top and bottom of the case.

5. Reassemble the unit. Plug the keyboard into the computer, turn the computer on, and test all the keys.

Even with constant daily use, your keyboard should last for years if it's properly maintained. And while you're at it, don't forget to give your keyboard a little love and respect now and then, OK?



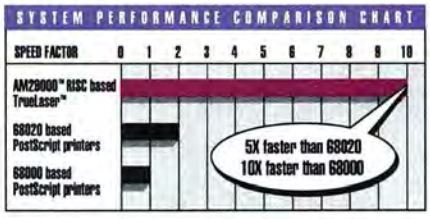
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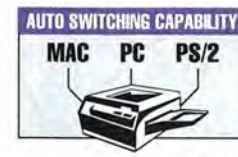
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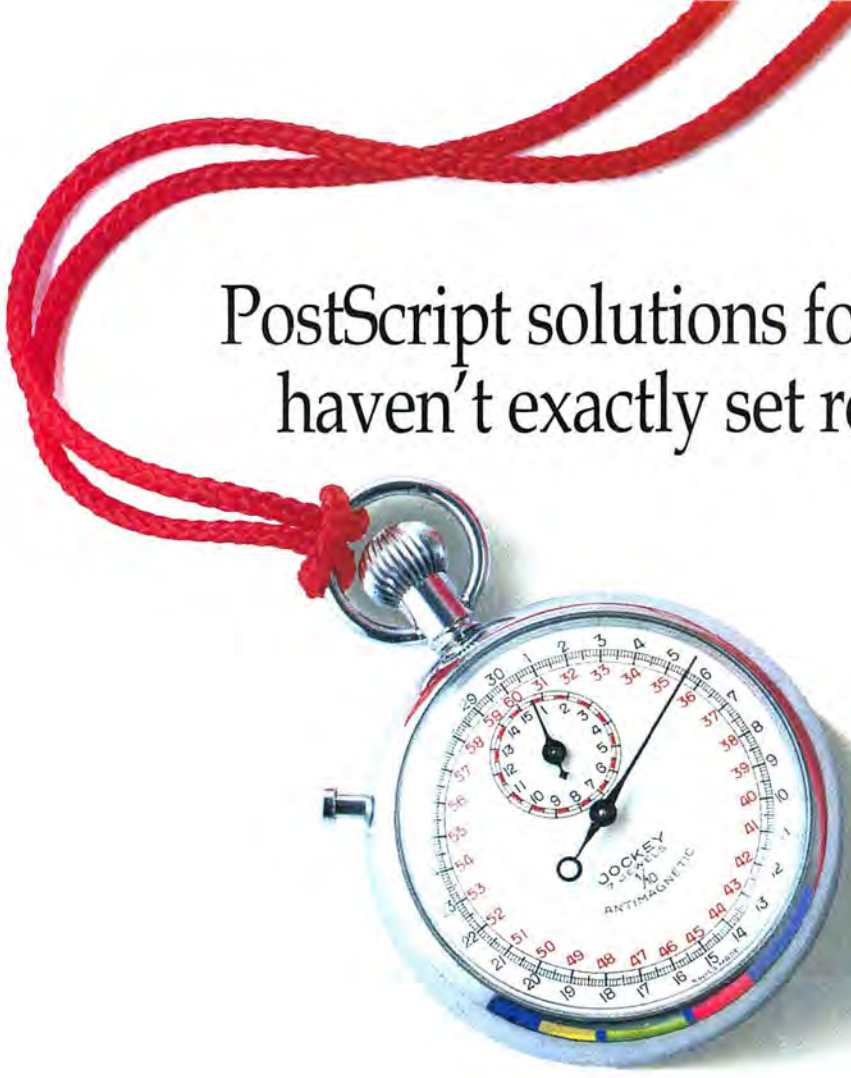
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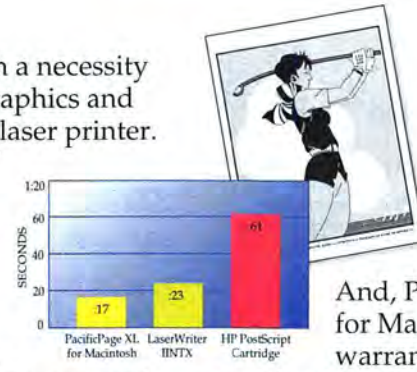
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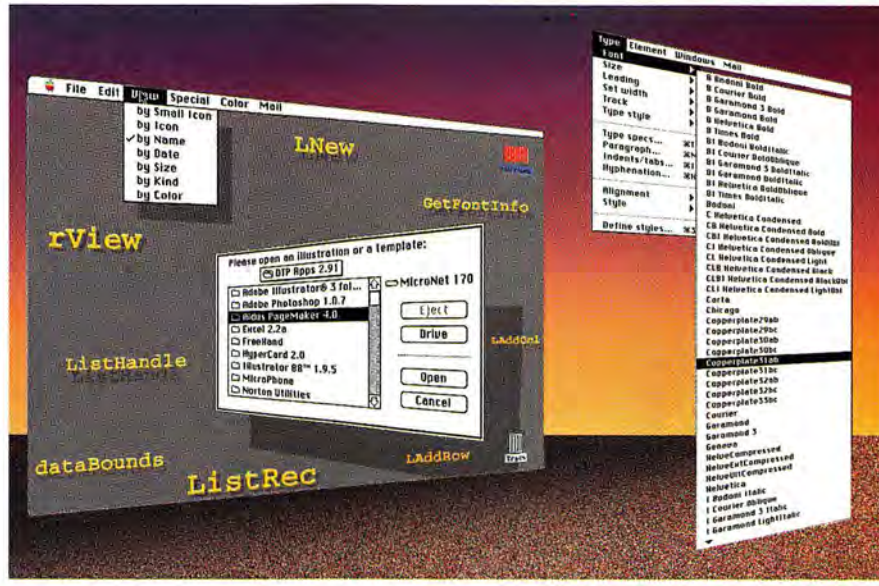
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List Magic

The scrolling list is a classic part of the Mac interface. Creating one in an application is as easy as mastering Apple's List Manager.

By Kurt W. G. Matthies and Thom Hogan



Some people don't type well. The nice thing about the Mac is that it doesn't matter: You don't have to type the name of the file you want to open or remember the name of the macro you want to use; you can just select what you want from a list.

Any Mac programmer will tell you that the user interface can make or break an application. Fortunately, Apple has put a lot of effort into helping developers create an intuitive user interface for their programs. One of the most intuitive aspects of the Mac interface is the scrollable list, which simplifies a variety of actions — from opening, closing, and saving files to selecting features within an application. Even when seeing a list for the first time, most people immediately know how it works. Developers can add lists to their applications by using the ROM Toolbox's List Manager, a set of data structures and routines. These routines are surprisingly easy to learn — most programmers master them in a day or so.

In this column, we'll describe how to create and manage lists as well as how to add data to them, display them, and read the user's mouse selection. For a detailed description of how to use specific List Manager routines, see Apple's *Inside Macintosh, Volume IV* (Reading, Massachusetts: Addison-Wesley, 1986). To complete the tutorial, we've written a sample application that demonstrates the use of the List Manager routines. If you're serious about using the List Manager, you'll want to get a copy of this source code (we'll tell you how later).

Creating a List

Each list has an associated window, and you locate a list within the window with a view rectangle, which bounds the list. The view rectangle (called **`rView`** in the list structure) does not include any scroll bars associated with the list, so if you want scroll bars, you'll have to make room for them by subtracting 15 pixels (the width of a scroll bar) from the right and bottom edges of the window's port rectangle. Most lists, however, are smaller than the window (see Figure 1).

A list consists of a series of equally sized cells that contain the list-item data. The cells' layout defines the list's dimensions. Lists can be one-dimensional, as in the single-column list in Figure 1, or two-dimensional, as in a spreadsheetlike matrix. (Bear in mind, however, that two-dimensional text lists are pretty rare — if your structure includes one, you might want to rethink your interface design.) A program accesses a cell with a *tuple* (a set of two numbers) consisting of a column index and a row index. These indexes start at 0, so the tuple **`0,2`** refers to the third cell of the first column. We call the tuple the *cell ID*.

You create a list with the List Manager routine **`LNew`**, which specifies the view rectangle, the list's initial dimensions, and the height and width (in pixels) of each cell. It also contains a pointer to the window associated with the list and some Boolean values that specify whether to draw the list when it's created, whether it has a grow box, and whether

Figure 1: List Elements

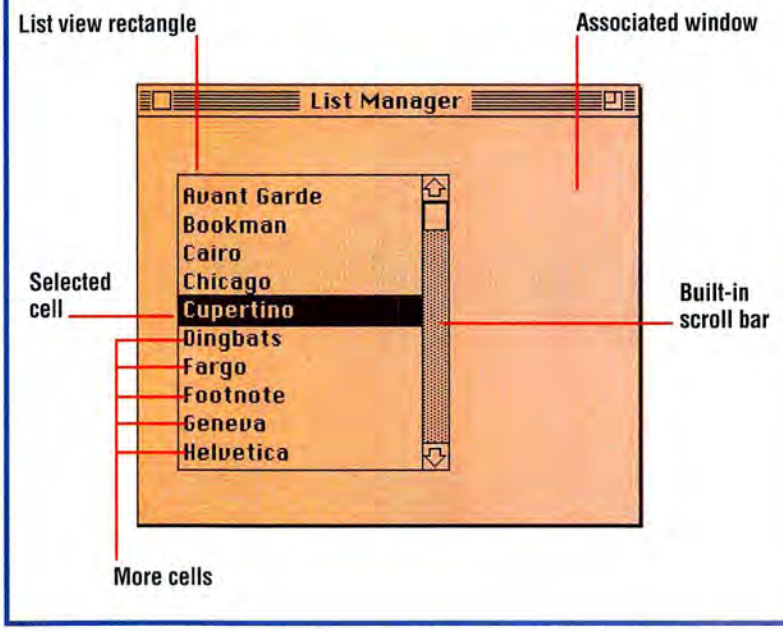


Figure 1: Scrollable lists let you use the mouse to make selections rather than having to type in commands. The List Manager (a set of data structures and routines) makes creating lists and their components fairly straightforward.

it has horizontal and/or vertical scroll bars.

The **ListRec** data structure is the foundation of the list's structure. It contains all the information about the list, such as the view-rectangle and cell sizes. It also contains a handle to the list's data. The **LNew** routine creates this data structure on the application heap and returns a handle to it. The program then passes the **ListHandle** to the List Manager routines that access the list.

Lists look best if the size of the view rectangle is a multiple of the cells' height. The List Manager expects the cell height to be the sum of the ascent, descent, and leading of the font you're using for the list's text (you can get this information from the Font Manager's **GetFontInfo** routine). If you're using the 12-point Chicago font, for example, this sum is 16 pixels, so the view rectangle's size should be a multiple of 16 pixels.

If you know how many words are in a list before you start, use those dimensions to create it. The **dataBounds** argument to **LNew** defines the list's dimensions. For example, if you want to allocate a one-dimensional list of ten elements, you set **dataBounds** to **0,0,10,0**. If you want to allocate a ten-by-ten list, you set **dataBounds** to **0,0,10,10**.

There are times, however, when you know the layout of the list but don't know how many cells you'll need until you've looked at the data. In such a case, you create a one-column list and add cells as needed by using the **LAddRow** routine. To create a single-cell, one-column list, you set **dataBounds** to **0,0,1,0**. You then use **LAddRow** to add cells to the list. A complementary call, **LAddCol**, adds columns to a list. The routines **LDelRow** and **LDelColumn** delete data from the list and adjust the list's internal size to reflect the list's new dimensions.

Managing List Data

You can add data to the cells with List Manager routines after you've created the list. Two routines, **LSetCell** and **LAddToCell**, add data to a cell — **LSetCell** by replacing a cell's contents and **LAddToCell** by appending data to the cell. **LGetCell** returns a cell's contents in a user-supplied buffer; **LClear** clears a cell's contents.

The List Manager keeps all cell data in a single relocatable block and maintains offsets to each cell's data. You'll find a handle to the data block in the **ListRec**



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You can add scrollable lists to your application by using the ROM Toolbox's List Manager, a set of data structures and routines that are surprisingly easy to learn — you'll master them in a day or so.

field cells and the offsets in the **cellArray** field. Although it's always a good idea to use the **LGetCell** routine to access list data, you can also get the data directly from the cell's field by using **LFind** to return the offset of a particular cell's data.

The List Manager lets you search for strings within the list by using the **LSearch** routine. If it finds the string, **LSearch** will return the cell ID of the cell in which it found the data in a **VAR** parameter. Because the cell ID in this **VAR** parameter specifies where **LSearch** begins searching for data, you can use **LSearch** to look for subsequent occurrences of the string by changing the cell ID returned from the first hit to the cell ID of the next cell in the list and then calling **LSearch** again. (To find the next cell ID, use the **LNextCell** routine.)

Managing the User Interface

One of the nicest features of the List Manager is the way it supports mouse selection. List tracking is automatic: As the user clicks or drags, the List Manager takes care of all highlighting. The List Manager's selection algorithm is very sophisticated and allows several selection options, such as single-cell selection, contiguous multiple-cell selection, and noncontiguous multiple-cell selection. You configure a list's selection rules by setting or clearing bits in the **ListRec selFlags** field.

You need to use the **LClick** routine so that the list can respond to a mouse-down event in its view rectangle. **LClick** processes the mouse-down, scrolling the list if necessary. In the sample application's code, we demonstrate how to use a list in a modal dialog box (one in which the user must make a selection). We've structured the code so that the dialog *hook proc* calls **LClick** and then passes it to the **ModalDialog** routine (which is part of the Dialog Manager). Whenever the Dialog Manager detects a mouse-down event in the dialog box, **ModalDialog** calls the hook proc, which in turn calls **LClick** if the event occurred in the list rectangle (for more information about using hook procs with the Dialog Manager, see "Let's Get Lost," September '90, page 329).

Once the user has made a selection, the program reads that selection with a combination of two routines: **LLastClick** and **LGetSelect**. **LLastClick** returns the cell ID of the last cell in which a mouse-down occurred. You pass the value that's returned by **LLastClick** on to **LGetSelect** in a **VAR** parameter, which will return **true** if the cell is still selected and **false** if it no longer is.

If you've allowed extended selection in your list (which lets the user select more than one cell), the program will use **LGetSelect** to find each subsequent selected cell. The **LGetSelect** routine's first argument, **next**, is a Boolean value that tells the routine which cell ID you want to match. If the program is processing all the selected list cells, it will

Example 1

```
aCell = LLastClick (listHdl);
/* get the first selected cell */
if (LGetSelect (false, &aCell, listHdl))
{
    do   /* process each selected cell in the list */
    {
      processCell (&aCell, listHdl);
      LNextCell (&aCell, listHdl);
    } while (LGetSelect (true, &aCell, listHdl));
}
```

Example 1: Using the `LGetSelect` routine for multiple selections



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call `LGetSelect` one time with the `next` parameter set to `false` for the first selected cell (the one in which the mouse-down occurred). The program then continues to call `LGetSelect` with the `next` parameter set to `true`, processing each selected cell until `LGetSelect` returns `false` (see Example 1).

Rendering the List

Speaking cosmetically, it's a pretty good idea to create a list that has its drawing capabilities turned off until the user has entered all data. This approach prevents the list from flashing as new data is added. You can set the `LNew` parameter `drawIt` to `false` to inhibit drawing in a newly created list. Once the user has finished entering data or manipulating the list, the `LDoDraw` routine turns drawing capabilities back on (otherwise the user won't see anything). The entire list then needs to be rendered.

Rendering a list is not a difficult process: The program simply needs to call `LUpdate` in response to an update event. In the sample code, we place `LUpdate` in an update proc, which is called by the Dialog Manager as a result of an update event for the window. (Whenever you add user items to modal dialog boxes, you must use an update proc to update the item, because the Dialog Manager handles the update event within the `ModalDialog` routine.)

If you change a cell's contents, the cell must be redrawn. The best way to do this is to invalidate the cell rectangle and let the update process handle the redraw. The List Manager routine `LRect` was designed for just this purpose. If, however, you want the application to redraw cells immediately *without* going through the update process, use the List Manager routine `LDraw`.

Nonmodal lists use the `LActivate` routine to tell the application how to respond when the window the list occupies is selected or deselected. The `LActivate` routine renders the list in its correct selected or unselected state according to its active parameter. The `LSize` routine enables a list to respond to resizing, resizing not only the list but also its associated scroll bars.

Finally, when the user has finished with the list, the `LDispose` routine gets rid of the list structure and its associated data. (Remember that a well-behaved application should always dispose of unused structures.)

That's all there is to the List Manager. Take some time to familiarize yourself with the specifics of using these routines. Because there's no better teacher than working code, we've put together a sample application that creates a list in a modal dialog box (the same one that's in Figure 1), adds some data to it, and monitors the user's selection. This code is available on Zmac or by sending a check for $15 made out to Kurt Matthies to 1150 Hancock Drive, Boulder, CO 80303.

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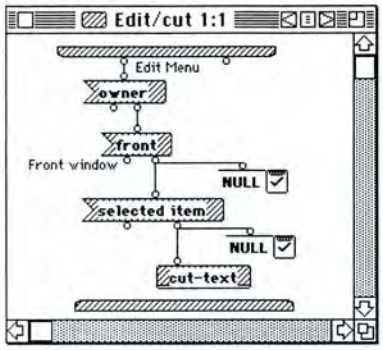
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Compiled by Gregory Wasson

FileMaker Pro

If you create FileMaker Pro templates on a Mac with a large monitor, it can be hard to know whether your layout will fit on a smaller monitor, such as the Classic's 9-inch screen. You can create a page guide for small screens by choosing Help from the Apple menu. This brings up a window exactly the size of a small Mac screen. Simply size your layout window so that it's the same as the Help window, and your layout will fit fine on a small-screen Mac.

Carrick H. Patterson
Little Rock, AR

Word

One of the worst aspects of Microsoft Word's mail-merge feature is all the stupid punctuation rules you have to follow. Trying to make sure you have quotes and commas in all the right places often isn't worth the effort, and it can make inputting addresses sheer hell. If you use Word's Table feature to create the data document for the merge, however, you can put the entire address — including commas and Returns — into one cell. Not only do you avoid having to enclose fields containing punctuation with quotation marks but you also don't need to use as many fields, because all address information (company name, street, city, state, and ZIP code) is contained in one cell under one field name. Unfortunately, you can't use the Table format if you want to sort your data by its parts, such as by ZIP code or city.

Deryk Sinotte
Calgary, Alberta
Canada

Excel

If you have several work areas on the same Excel worksheet (for example, one for expenses, one for income, and one for a summary), you can sometimes run into layout problems when you add columns or rows to one of the areas. To avoid this, stagger the

Tip of the Month

PageMaker 4.0

Newsletters and magazines often have a subhead style that requires type to be reversed out of a solid box, similar to the heading in the top left corner of this page. Unfortunately, PageMaker 4.0 doesn't let you create such subheads as in-line graphics that remain anchored to the text. And if you try to duplicate the effect by reversing out type on top of a black box, it's hard to position the subhead consistently throughout the publication. You can, however, use PageMaker 4.0's Paragraph Rules feature to create a thick black rule (up to 24 points in size) over reversed-out type that functions as an in-line graphic (see Figure A). Here's how (the following instructions are for an 18-point rule):

1. Select the subhead text, and choose the Paragraph command (Command-M) from the Type menu. Select the Rules option. Create a 6-point rule above the paragraph and a 12-point rule below. Choose whether the rule will extend the width of the column or the width of the text (you can also indent or extend the rule by typing values into the Indent fields).

2. In the Options dialog box, set the units above and below the baseline to 0. Click on OK.

3. To center the text vertically in the rule and to reverse out the type, select the rule and choose Type Specs from the Type menu (Command-T). Check the Reverse box under Type Style, and set Position to Subscript. Within the Options dialog box, change the subscript size to 100 percent and set the subscript position to a lower percentage if necessary (in this case, 17 percent, or half the default 33.3 percent). If you can't see the reversed-out text, try zooming the page view in or out to refresh the screen.

4. With the paragraph still selected, use the Type menu's Define Styles command (Command-3) to save all these settings as a style.

Wayne S. Hill
Charlotte, NC

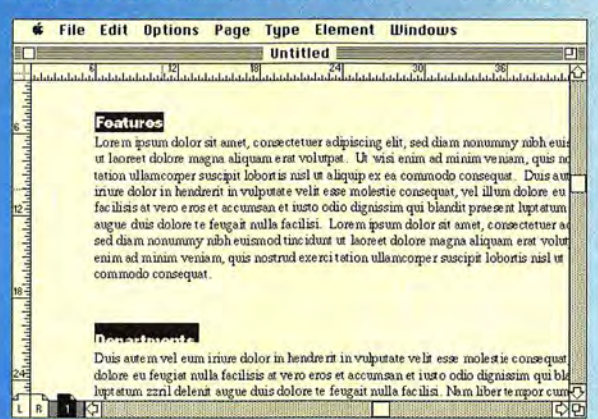


Figure A: The top subhead was created with PageMaker 4.0's Paragraph Rules feature. It acts like an in-line graphic, remaining anchored to the surrounding text. The lower example, created by placement of reversed-out text on a filled rectangle, needs to be repositioned each time the document is repaginated.

Worksheet1

	A	B	C	D	E	F
1	Quarter	Expenses	Income			
2	1	$12,000	$11,600			
3	2	$9,000	$12,546			
4	3	$10,987	$12,784			
5	4	$7,693	$13,499			
6	SUMMARY	$19,693	$25,099			
7				Month	Supplies	Postage
8				January	$2,098.00	$234.56
9				February	$1,125.87	$127.42
10				March	$1,072.97	$174.96
11						
12						

Figure 1: A new slant on Excel worksheets: Staggering your work across the page lets you safely insert columns and rows without disturbing nearby work areas.

various work areas along an invisible diagonal running through the worksheet. This ensures that adding rows or columns in one area will not affect any of the other areas (see Figure 1).

K. McFarlane
Santa Cruz, CA

Keyboard

If you want a really cheap and easy way to protect your keyboard from dust or coffee spills, try wrapping it in plastic cling wrap. It lasts two to three months, and as long as you don't wrap it too tightly, the keyboard "touch" is the same.

Changhsu Liu
Bloomington, IN

QuarkXPress 3.0

If you get a Bad File Format error when you're attempting to open a QuarkXPress 3.0 document, the document is history. You can, however, recover most of the text in the file by using the Open Any File command in Microsoft Word 4.0. Access this command by holding down the Shift key as you pull down the File menu (you can also add this command to the menu by using the Commands item on the Edit menu). The text may be somewhat scrambled and there will be some garbage in the file, but until I told Quark's tech-support department about this solution, the response was that a Bad File Format error meant the file and its contents were lost forever. And forever is a long, long time

Kim Baker
Mesa, AZ

DA Handler

It can take a long time to access DAs under MultiFinder, because you have to wait for the DA Handler to start up. You can disable the DA Handler by holding down the Option key when you select the DA (if you use Suitcase II, pull down the Apple menu *before* you press the Option key, or you won't see your DAs listed). The DA opens faster because it opens in the current application's allotted memory space, just as it would under the Finder, rather than in the DA memory block that MultiFinder assigns. This is particularly useful for the Control Panel and the Chooser DAs, which are slow to start anyway.

You should use this technique *only* if you intend to close the DA immediately after using it; otherwise, it may cause memory problems for the active application. If you like to keep the Scrapbook open while you work on other things, for example, you should probably select it without the Option key so that it has its own memory space under MultiFinder.

Samuel Reynolds
Los Angeles, CA

Illustrator 3.0

Creating the look of embossed text is a little harder than creating effects such as outlines, shadows, and drop

Tips from the Experts

DeltaGraph 1.5

This month DeltaPoint shares some tips on how to get the most out of its popular charting program, DeltaGraph 1.5.

High-Resolution Charts. To get the highest possible resolution when printing charts pasted into Microsoft Word documents, make sure you do the following. Before you copy and paste the charts into Word, go to the DeltaGraph Edit menu. Choose Preferences, and make sure that the PostScript in Pictures option is checked. This will copy PostScript comments into the Clipboard with the document.

Changing Labels. Line and scatter charts usually have symbols indicating data points (see Figure B), but you can substitute category labels for the data points:

1. Plot your data, including category labels, as a line or scatter chart. Select the chart.

2. Go to Options on the Chart menu, and turn off Show Symbols. Click on OK.

3. Pull down the Chart menu again, and go to Show Values. Select the Location pop-up menu, and choose On. Select the Text pop-up menu in the same dialog box, and choose Category. Click on OK.

4. If you want to connect the data points on a scatter chart, go back to the Options command on the Chart menu and turn on Connect Points.

Drop Shadows. It's possible to create proportionally correct drop shadows for charts and legends. Here's how:

1. Use the rectangle tool to draw a filled box that exactly covers the chart. Do the same for the chart's legend. Select both boxes.

2. Drag the filled boxes slightly down and to the right (hold down the Option key to prevent the snap-to-grids function from hampering placement).

3. Send the boxes to the back with the Drawing menu's Send command.

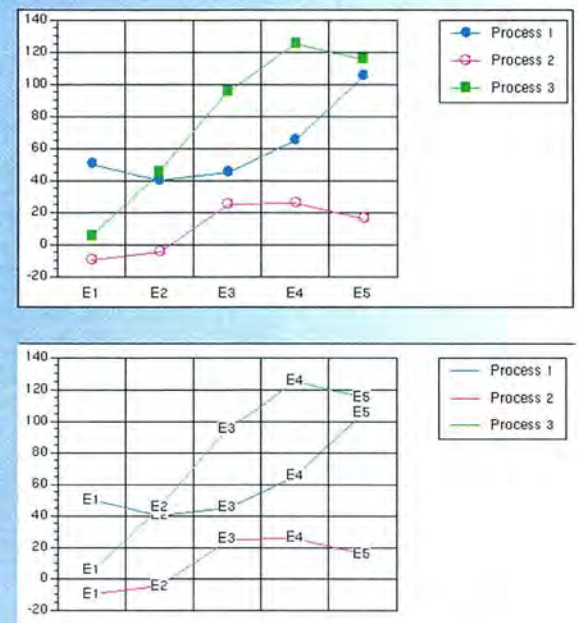
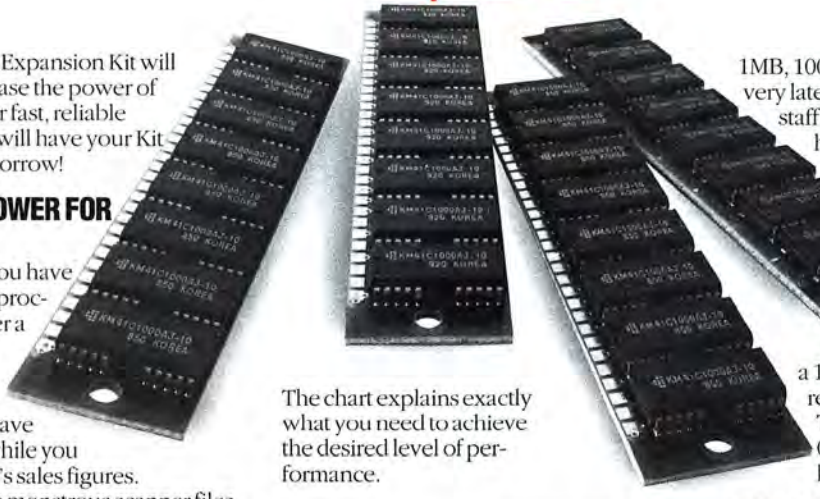


Figure B: Line and scatter charts usually have symbols indicating data points (top), but sometimes it's more effective to replace the symbols with category labels (bottom).

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2-1/2 MB	Remove only two 256K SIMMs, install two 1 MB SIMMs.
4 MB	Replace all four 256K SIMMs with four 1 MB SIMMs.
To upgrade an 8-socket Mac II, IIx, IIcx, oe SE 30 to this amount of memory.	**Do this: (Install in multiples of four only.)**
4 MB	Remove all four existing 256K SIMMs, install four 1 MB SIMMs, leave remaining sockets for future expansion.
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If, for any reason, you are dissatisfied with your MacWAREHOUSE Memory Kit, you may return it for a full refund within thirty days of purchase. All you have to do is call us for a return authorization number and return this product, postage paid, in its original condition, with the original packaging and documentation.
ONE YEAR WARRANTY. MacWarehouse also guarantees its Memory Kits against manufacturer defects for one year from the date of purchase. We will repair the item or replace it at our discretion.

* SIMMs prices vary. Call for latest information.
** Limited Offer! Free video with purchase of 2 or more SIMMs.



MUF1P



GUARANTEE

Many of our products come with a thirty day money back guarantee, if you are not completely satisfied. Ask for details when you place your order.



TrueLaser Printer (Microtek)
This revolutionary new laser printer gives you, for the first time, TrueImage support, plus PostScript and PCI compatibility, and at phenomenal performance speeds. It comes with TrueType fonts, the same font technology that will go into every Macintosh running System 7.0 and IBM running Windows 3.1. And TrueLaser is smart enough to automatically switch between different printer interfaces—AppleTalk, Centronics, And RS-232C—all transparent to the user. It's powered by a 32-bit RISC microprocessor, AMD's Am29000, and it's 300 dpi resolution will assure that all your graphics and layouts will come out looking their best. **INP 0162 $2019.**



Microsoft Excel 3.0 (Microsoft)
Microsoft Excel 3.0 offers many dramatic improvements in spreadsheet operations. You can place cells, graphs, and text anywhere, on the same page. Excel's Toolbar (with Autosum) automates common operations to save you time. The outliner expands spreadsheets to show detail, or contracts them to show broad structure. You can display your data with 68 different chart types, 24 in 3D. Excel also accesses remote databases through Apple's Data Access Language (DAL). Add support for System 7.0, plus goal-seeking and equation solving, and Excel will stimulate you to look for new problems to solve.
BUS 0167 $329.

ACCESSORIES

Toner Cartridge
LaserWriter II 105.
Basic Needs, Inc.
ACC0356 Dust Cover - Mac II & Extended Keyboard (grey nylon) 17.
ACC0348 HardTops ImageWriter II Cover 17.
ACC0347 HardTops Mac Extended Keyboard Cover 16.
ACC0346 HardTops Mac Standard Keyboard Cover 15.
ACC0466 MacIIcx/ci Monitor Stand 49.
ACC0351 Utility Pac 15.
B.A.S.F. (BASF)
MED0030 Disks - DS/HD 1.44 Meg (box of 10) 22.
MED0041 Disks - Preformatted DS/DD (box of 10) .. 14.
MED0040 Disks - Preformatted DS/HD (box of 10) .. 25.
MED0029 Disks - DS/DD (box of 10) 12.
Curtis
ACC0469 Command Center 89.
Ergotron
ACC0344 MacTilt II - 13" Color RGB 75.
ACC0128 MacTilt Plus/512 - Platinum 68.
ACC0009 MacTilt SE, SE/030 - Platinum 68.
I/O Design, Inc.
ACC0028 MacLuggage™ Plus Carrying Case 64.
ACC1070 MacLuggage™ SE Carrying Case 75.
ACC0327 Monitorware Apple RGB Case 79.
ACC0427 Ultimate SE Carrying Case - Black 79.
ACC0440 Ultimate SE Carrying Case - Navy 79.
ACC0529 Ultimate Classic Carrying Case - Black 79.
ACC0528 Ultimate Classic Carrying Case - Navy 79.
Kensington
ACC0459 Maccessories SE Radiation Anti-Glare Filter 52.
ACC0097 System Saver Mac - Platinum 63.
Mobius Products
ACC0055 Fanny Mac QT 55.
ACC0247 SE Silencer 39.
PowerUser™
BND0013 PowerUser Carrying Case w/Free Cap 69.
Sony
MED0031 Disks - 1.44 Mb High Density (3.5) 24.
MED0003 Disks - DS/DD (box of 10) 13.



MacPro Plus (Key Tronic)
Key Tronic's new MacPro Plus keyboard is compatible with all Macintosh computers. The enhanced 105-key layout includes Period/Comma lock capability, an interchangeable Caps Lock and Ctrl keys. Also, the connecting cable you need is offered at no extra charge. The keyboard is backed by a limited lifetime warranty and unlimited toll-free product support. Includes offer for Tempo II, a keyboard macro package from Affinity Microsystems a $149.95 value FREE! **INP 0156 $145.**

Targus, Ltd.
ACC0251 Imagewriter II Carry Case (black) 49.
ACC0438 MacIIcx/ci Carrying Case - Black 79.
ACC0252 MacPlus/SE Carrying Case (black) 65.
MacPlus/SE- Ext Keyboard Carrying Case 79.
ACC0482 Premier Leather Case 185.

ACCOUNTING & PERSONAL FINANCE

Aatrix Software
FIN0050 Checkwriter II 3.2 32.
FIN0041 Payroll 3.5 109.
FIN0113 Ultimate Payroll 199.
Absolute Solutions, Inc.
FIN0086 Computerized Classic Accounting 225.
Checkfree Corporation
FIN0088 CheckFree 21.
Computer Associates
FIN0044 ACC PAC Bedford Simply Accounting 1.1 139.
Inman
FIN0013 Business Sense 129.
Intuit
FIN0043 Quicken 1.5 45.
Meca
FIN0039 Andrew Tobias' Managing Your Money 4.0 99.

Nolo Press
BUS0133 For The Record 2.0 32.
BUS0132 WillMaker 4.0 37.
Peachtree
FIN0059 At Once! 285.
Reality Technologies
FIN0068 WealthBuilder (Mac) 99.
Softsync/BLOC Publishing
FIN0048 Accountant Inc. Professional 339.
Teleware, Inc.
FIN0087 M.Y.O.B. 2.0 145.
TimeSlips Corp.
FIN0129 TAL 55.

BUSINESS & PRESENTATION

A Lasting Impression
BUS0086 ResumExpert Cover Letters 49.
BUS0107 Computer Science & Engineering 49.
BUS0110 Education 49.
BUS0102 Manager Edition 49.
BUS0103 Sales & Marketing Edition 49.
BUS0106 Students 49.
BUS0087 ResumExpert (Word 3.0/4.0 version) 49.
Abacus Concepts
STA0006 MacSpin 185.
STA0008 StatView II 1.03 319.
STA0010 StatView SE+Graphics 1.03 199.
STA0022 SuperANOVA (MacII Family) 309.
Abbott Systems, Inc.
BUS0131 Cheshire 1.0 62.
Acius
DAT0045 4th Dimension 2.1 489.
AEC Management Systems
BUS0129 FastTrack Schedule 1.5 139.
DAT0055 AEC Information Manager 409.
After Hours
DAT0076 TouchBASE 89.
Aldus
BUS0066 Persuasion 2.0 329.
ASD Software, Inc.
BUS0134 Planisoft 195.
BUS0146 Planisoft - 5 pack 579.
BUS0147 Planisoft - 10 pack 839.
Ashton-Tate
DAT0042 dBase Mac SPECIAL! 59.
BUS0054 Full Impact 1.1 SPECIAL! 59.
Avery
ACC0489 MacLabelPro 49.
Index Maker From 12-18.
Ready Index From 1.50-3.00
Baseline Publishing
BUS0149 1 Shot Worksheet 59.
Casady & Greene, Inc
DAC0010 QuickDex 36.
CE Software
BUS0135 Alarming Events 85.
GRA0070 CalendarMaker 3.0 31.
Claris
DAT0064 FileMaker Pro 215.
BUS0058 MacProject II 2.1 359.
BUS0065 SmartForm Designer 289.
DeltaPoint, Inc.
BUS0099 DeltaGraph 1.5 129.
Fox Software
DAT0047 FoxBase+/Mac 2.0 292.
Informix
BUS0064 WingZ 1.1 245.



SmartBundle (T/Maker)
Includes four outstanding applications to make life easier, especially for new Mac owners. Each has won a MacUser Eddy Award. The word processor, WriteNow 2.2, combines ease of use with high performance (spelling checker, thesaurus, mail merge, footnotes). The spreadsheet, Full Impact 1.1, crunches your numbers and displays them in attractive charts. SuperPaint 2.0 combines drawing with a paint program, plus an AutoTrace tool. RecordHolder Plus is perfect for keeping names and addresses, invoices, and sales call records.
BUS 0152 $215.

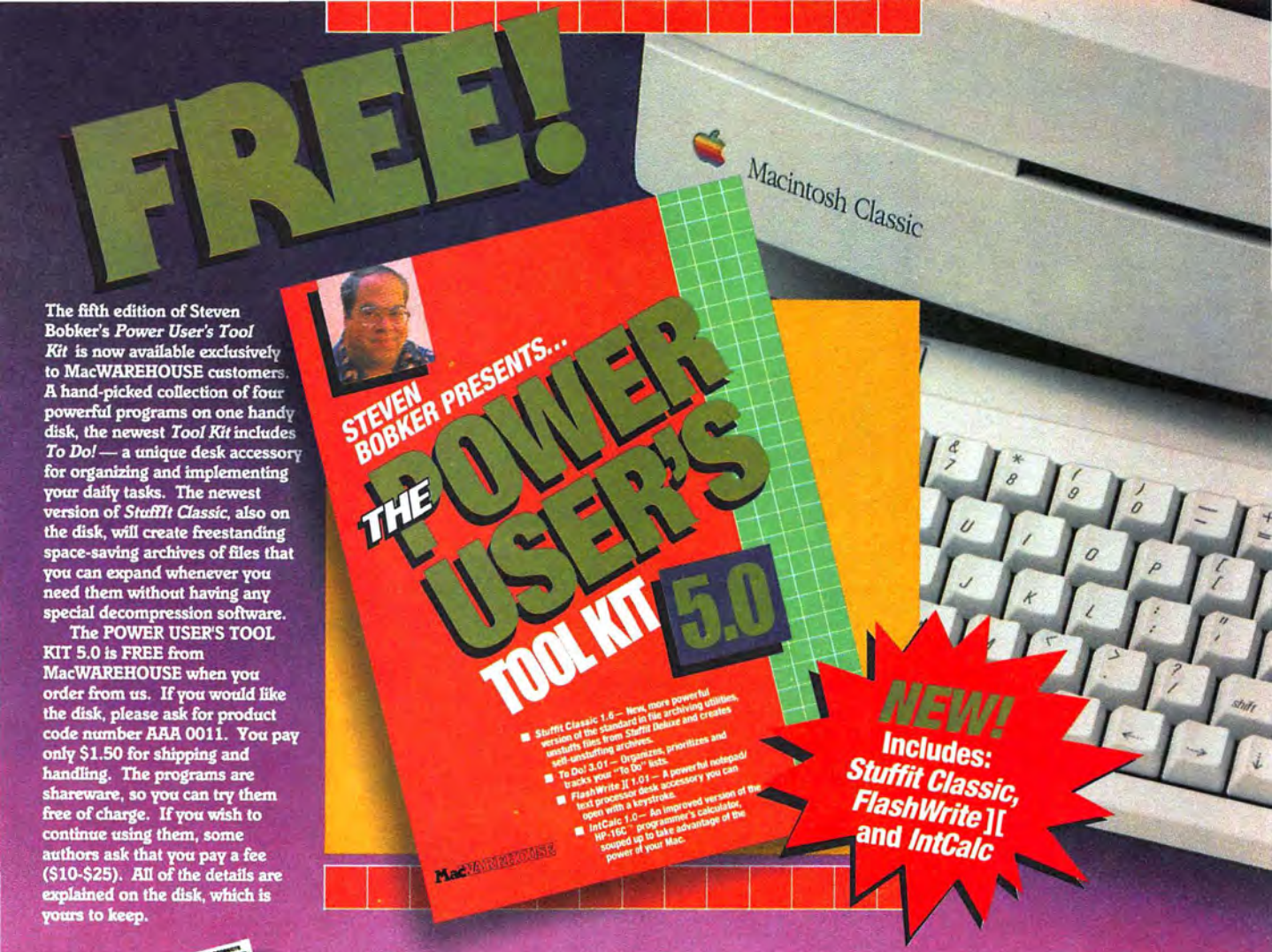


ResumExpert (Word 3.0/4.0 version) (A Lasting Impression)
Whether you're seeking an entry-level position or an executive's corner office, the ResumExpert Software Series is the next best thing to knowing the boss. Professionally written and fully-formatted Microsoft Word templates let you easily create eye-catching resumes. MacUser 10/89 awarded ResumExpert 4 mice and raved about the "excellent manual" that includes expert writing tips. MacUser 12/89 rated it as one of the Top 200 software Programs of 1989. **BUS 0087**. Full line available. **$49 ea.**

FREE!

The fifth edition of Steven Bobker's *Power User's Tool Kit* is now available exclusively to MacWAREHOUSE customers. A hand-picked collection of four powerful programs on one handy disk, the newest *Tool Kit* includes *To Do!* — a unique desk accessory for organizing and implementing your daily tasks. The newest version of *StuffIt Classic*, also on the disk, will create freestanding space-saving archives of files that you can expand whenever you need them without having any special decompression software.

The POWER USER'S TOOL KIT 5.0 is FREE from MacWAREHOUSE when you order from us. If you would like the disk, please ask for product code number AAA 0011. You pay only $1.50 for shipping and handling. The programs are shareware, so you can try them free of charge. If you wish to continue using them, some authors ask that you pay a fee ($10-$25). All of the details are explained on the disk, which is yours to keep.

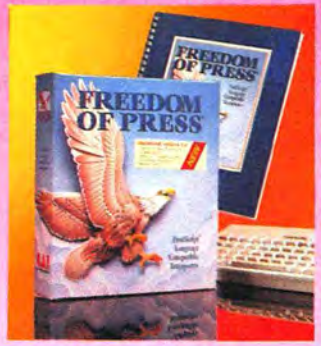




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The "ULTIMATE" SE Carrying Case (I/O Design, Inc.)
The "ULTIMATE" SE Carrying Case is designed with the same high quality standards as other MacLuggage products. This case offers internal, padded compartments for ANY Macintosh keyboard, mouse, external hard disk and cables also holds the new Macintosh Classic. It also features 2 additional exterior pockets for everything from disks to umbrellas. Combine these features with sturdy Dupont Cordura nylon and 1/2 inch high density foam padding and you'll see why this is the "Ultimate" carrying case for your Mac. **Black: ACC 0427 $79. Blue: ACC 0440 $79.**





Freedom of Press Light for the Mac (Custom Applications)
Need the power of PostScript at a price you can afford? Use top-rated Freedom of Press Light to print your PostScript language documents on over 40 non-PostScript inkjet, dot matrix, and laser printers including HP DeskWriter, LaserJet and PaintJet. Works with PageMaker, Illustrator and Xpress. Includes 17 scalable, outline fonts and supports ATM and Adobe Type 1 fonts. **$55. UTI 0185**



MacDraft 2.1 (Innovative Data)
Provides the tools you need to create accurate drawings on your Mac. It supports PostScript output, has a moveable geometric drawing tool palette, multiple layers (limited only by available memory), on-line symbol libraries, 44 different scales, custom line styles, dimension lines, Bezier and spline curves, automatic area calculation, and smoothing of freehand shapes. MacDraft supports 32-bit QuickDraw and custom fill patterns in both black and white and color. Reads TIFF and MacDraw II files.
CAD 0039 $299.

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JAM Software
DAC0032 Smart Alarms 3.0 (Single User) 64.
DAC0033 Smart Alarms 3.0 (1-4 users) 125.
DAC0034 Smart Alarms 3.0 (5-8 users) 189.
Kaetron
BUS0100 TopDown 2.0 219.
Microsoft
BUS0167 Excel 3.0 329.
BUS0008 PowerPoint 2.01 245.
BUS0088 The Microsoft Office 529.
BUS0014 Works 2.0 199.
On Technology
BUS0165 Meeting Maker 5-User 325.
BUS0166 Meeting Maker 10-User 595.
Portfolio Systems
BUS0101 Dynodex - The Instant Address Book 75.
DTP0055 DynoPage 57.
Power Up
BUS0096 Address Book Plus 52.
BUS0073 Calendar Creator 35.
BUS0121 FastForms 2.0 105.
Round Lake Publishing
BOK0007 LetterWorks 59.
BOK0016 Sales LetterWorks 59.
Satori
BUS0025 Bulk Mailer 3.2.5 75.
Shana Corp.
BUS0125 Informed Designer 159.
BUS0162 Informed Manager 99.
Softview (Full line available)
BUS0138 if:X Forms Designer 175.
if:X Expense Reports ea. 49.
Symantec Corporation
BUS0055 More 3.0 265.
Symmetry
BUS0075 KeyPlan 239.



DiskFit 2.0 (SuperMac)
Protect your valuable data from hard disk crashes. Allow DiskFit to make unattended daily backups. It copies only those files you've changed since the last backup. The new tree-like interface gives you greater control over what to backup (select particular volumes, folders, file types, creator applications, or documents only). It supports nearly all backup media, from floppy disks (with automatic loaders) and Syquest cartridges, to tape drives. **UTI0203 $59.**

Synex
BUS0120 MacEnvelope Plus 2.0 185.
Timeslips
BUS0043 Timeslips III 2.0 195.
T/Maker
BUS0152 SmartBundle 215.
Vertical Solutions
BUS0113 FastEnvelope 45.
BUS0105 FastLabel 2.0 45.
Wolfram Research, Inc.
STA0014 Mathematica II 1.2 699.
Zedcor
BUS0118 DESK 3.03 229.

CD-ROM

EDUCORP
CDR0006 EDUCORP CD-ROM 5.0 159.
CDR0003 EDUCORP Clip Art CD 45.
CDR0010 Int'l. Graphics Library 229.
EDU0198 Lingua-ROM 399.
Wayzata Technology
EDU0194 The World Fact Book 79.
Microsoft
BUS0019 The Microsoft Office CD-ROM 599.

COMMUNICATIONS & NETWORKING

Caravelle Networks Corporation
NET 0099 Mac to Mac - 5 pack 165.



UnMouse (Microtouch)
The UnMouse does everything a mouse can—only faster, easier, and in less space. To move the cursor, simply slide your finger over the glass surface. To make a selection merely press down. The UnMouse also serves as an exteneded keyboard. Tap the large red button and you have a Power Keypad with 16 keys instantly available to execute macros (60 in advanced mode). With its one million touch points the UnMouse also performs as a small graphics tablet. **INP 0084 $189.**

NET0100 Mac to Mac - 10 pack 229.
NET0101 Mac to Mac - 50 pack 979.
CE Software
COM0054 In/Out (5 user Pak) 128.
COM0041 QuickMail 2.2 (1 - 10 users) 315.
CompuServe
COM0008 Membership Kit 23.
COM0040 Navigator 3.0 49.
DataViz
COM0001 MacLink Plus / PC 5.0 129.
COM0052 MacLink Plus / Translators 5.0 109.
Dayna Communications, Inc.
UTI0116 DOS Mounter 55.
Farallon™ Computing
COM0078 Liaison 3.0 259.
NET0005 PhoneNET® 128/512 35.
NET0084 PhoneNET® Manager's Pack 669.
NET0007 PhoneNET® Plus, SE & II 33.
NET0040 PhoneNET® Plus, SE & II - 10 Pack 219.
NET0019 PhoneNET StarController® 825.
NET0059 StarController™EN (EtherNet) 1589.
NET0058 Timbuktu® 2.0 - Remote Access Pack 845.
NET0038 Timbuktu® 3.1 95.
NET0034 Timbuktu Remote® 2.0 123.
PhoneNET® Card for EtherNet:
NET0089 Nubus Mac II 359.
NET0091 SE/30 359.
NET0090 Nubus 10-pack 3259.
FreeSoft
COM0060 White Knight 11 85.
Hayes
COM0015 Smartcom II 3.2 84.
Insignia
UTI0174 AccessPC 65.
COM0063 Soft PC AT/EGA Module 125.
COM0045 SoftPC 1.3 245.
International Business Software
NET0097 DataClub - 3 Pack 199.
NET0098 DataClub - 10 Pack 539.
Microcom
NET0041 Carbon Copy Mac - single 117.
NET0088 Carbon Copy Mac - twin 189.
Prodigy
COM0056 Prodigy Starter Kit for the Mac 27.
Sitka
NET0056 InBox Plus 3.0 1299.
NET0057 DOSTOPS 3.0 165.
NET0049 MACTOPS 3.0 187.
Software Ventures
COM0043 Microphone II 3.0 215.
Technology Works
NET0117 GraceLAN 50-User 219.
Traveling Software
NET0045 Lap-Link III - Connectivity Pac 99.

DESKTOP PUBLISHING

Aldus
DTP0045 PageMaker 4.0 499.
DTP0047 PrePrint 329.
Letraset
FON0086 LetraStudio 275.
Multi Ad Services
DTP0042 Multi Ad Creator 2.5 499.
Post Craft
DTP0063 Layouts 85.
Quark, Inc.
DTP0028 QuarkStyle 199.
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- C.O.D. orders ship via UPS (Blue Label if you are more than 2 days from us via UPS Ground). Charge is $6 including shipping.
- Alaska, Hawaii, outside continental U.S., APO/FPO call 908-367-0440 for information.

*Defective software replaced immediately. Hardware replaced or repaired at our discretion. **We regret that we cannot be responsible for typographical errors."

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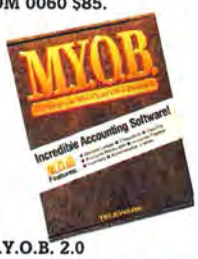
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Supports the new ZModem protocol, as well as more versions of XModem and Kermit. It works with MultiFinder and QuickDraw and large monitors. Get a free subscription to GEnie and a free copy of Okyto with each copy of White Knight. **COM 0060 $85.**



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Streamlines your accounting, and delivers essential information on the status of your business. Create a sales invoice and MYOB adds the amount to Receivables, decrements the inventory, and generates the monthly customer statement. Integrating G/L, A/R, A/P, Inventory and card files. **FIN 0087 $145.**



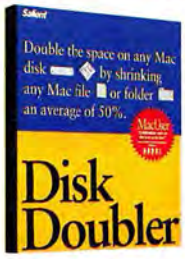
PowerKey
Lets you turn on your Mac and up to three peripherals with the switch on the ADB keyboard. The Shut Down command turns the entire system off. Offers programmable power ups great for unattended backups. Turn on your Mac with a phone call for remote file access. Optional cable required. **ACC 0535 $65.**



Images With Impact!
People 1 Collection!
The newest images from 3G Graphics include superbly drawn illustrations of ethnic women and men in diverse occupations and livelihoods. Comprehensive categories are: Business; Industry; Healthcare (hospital and clinical settings); Fitness; Sports and Arts & Entertainment. **GRA 0257 $95.**

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DiskDoubler 3.1
Compresses your files when saved and expands them when opened. Shrinks any file an average of 50%. It's like getting a new hard disk at a fraction of the cost. Version 3.1 retains icons of the original document, making Disk Doubler even easier to use. Works with documents, applications and more. **UTI 0179 $45**



Off-Line
A complete disk management system that's easy to use. Unlike other disk utilities, OffLine was designed and optimized to manage floppy disks. Catalogs automatically, searches on multiple criteria, prints disk labels, and exports to other applications.
UTI 0207 $51.



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The only V.32 Data Modem that gives you the ability to send and receive faxes using a 9600 Data Modem and a 9600 Send/Receive Group III Fax. Comes with MAcKNOWLEDGE (TM) communications software.
MOD 0052 $699.



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Design your home from a library of sample plans that calculate distances, diagonals, areas, and angles, then create the interior with a showcase of hundreds of furniture shapes arrangable in eight different views. When finished just print and begin building. **$65. ea.**

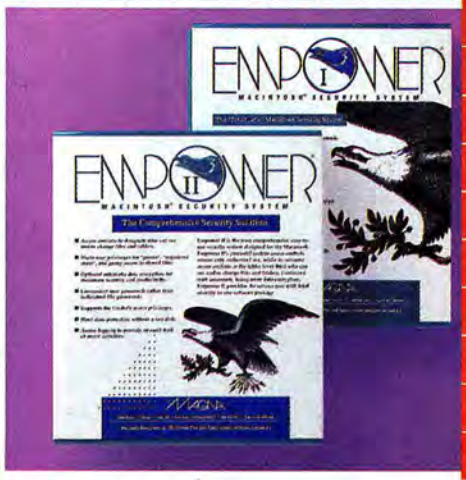
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Dayna Communications, Inc.
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DRI0104 DaynaFile single 360K (5 1/4) 499.
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MicroTech International, Inc.
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DRI0311 Europa 100 Meg Drive 699.
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DRI0309 Europa 40 Meg Drive 399.
DRI0310 Europa 80 Meg Drive 599.
DRI0307 MicroTech R50 50 Meg Removable 979.
DRI0304 Nova N40 40 Meg Drive 565.
DRI0305 Nova N80 80 Meg Drive 745.

Empower I (Magna)
Provides password security for your Mac. Only registered users with the correct password can gain access to the data stored on floppy and hard disks. A screen saver hides displayed data from prying eyes. It can prohibit startup from floppies, and a log keeps track of all attempts to use your Mac. **UTI 0166 $89.**

Empower II
Offers three forms of security. First, it restricts access to authorized users at the system level. Then it restricts access to folders and files with options to view only, or make changes. You can specify access by individuals or by groups. Finally, it provides automatic, transparent DES encryption to protect sensitive data.
UTI 0146 $155.



Help Software, Inc.
EDU0108 Desktop Help for Excel 52.
HyperGlot Software Company
Pronunciation Tutor w/ Sound: Chinese, French, German or Spanish . ea. 35.
Tense Tutor: French, German, Spanish or Italian ea. 39.
Verb Tutor w/ Sound: French, German, Spanish or Italian ea. 39.
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EDU0246 Easy Kana - Japanese 129.
EDU0245 RefBase 105.
Learning Company
EDU0084 Math Rabbit 30.
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Visionary Software
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Voice & Video
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EDU0063 HyperCard Getting Started Video 39.
Zondervan Publishing House
BOK0021 MacBible - King James Version 59.
BOK0020 MacBible - New International Version 59.



Scan 300/Color (Abaton)
This 24-bit color and grayscale scanner provides the image scanning power of the future without sacrificing the standards of today. It is capable of scanning color, grayscale, halftone and line art images in resolutions ranging from 72 dpi to 300 dpi. Works in both Macintosh and IBM environments with most popular graphics and OCR packages. Comes with Interface Kit and Adobe Photoshop. **$1899. INP 0157**

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DRI0326 105 Meg External Hard Drive 499.

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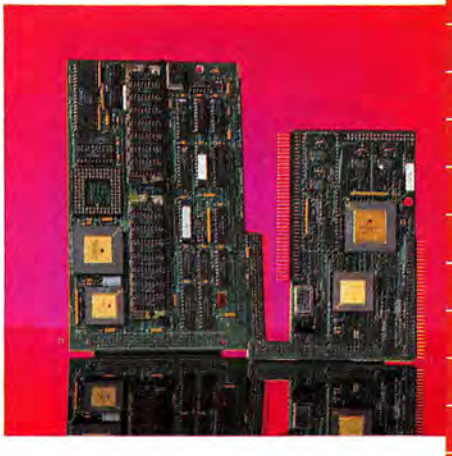
Beacon Technology, Inc.
HYP0034 HyperBible International Version 2.0 129.
HYP0035 HyperBible King James Version 2.0 129.
Broderbund
EDU0170 The Playroom 29.
Davidson & Associates
EDU0037 Math Blaster 29.
EDU0118 Math Blaster Mystery 29.

ENTERTAINMENT

Artworx
ENT0303 Bridge 6.0 29.
Baseline Publishing
ENT0351 Talking Moose 23.
Broderbund
ENT0259 Shufflepuck Cafe 25.
Where is Carmen Sandiego? ea. 29.
Bulls City Software
ENT0308 Moriarity's Revenge 35.
Bullseye
ENT0045 Ferrari Grand Prix 1.6 31.
ENT0046 Fokker Triplane Flight Simulator 2.8 25.
ENT0261 P51 Mustang 2.80 35.
Centron Software, Inc.
ENT0329 BlackJack Strategy Tester (w/ BlackJack Ace) 65.
ENT0277 Casino Master 45.
ENT0289 Casino Master Deluxe Mac II Version 49.
ENT0257 CrapsMaster 27.

Gemini and Mercury Accelerators (Total Systems)
Premium Gemini Accelerators will let your Mac SE outperform a IIci! Recommended by both MacUser and MacWorld (August 1990). The Plus Kit adapts the board to a Plus, 512KE, even an old 128KE. Optional math coprocessor speeds up math functions. The new value priced Mercury line provides System 7 without a dead end! Modular design allows the addition of expansion modules. Coupon included for FREE copy of VIRTUAL. Full line available.

Mercury/Plus: DRI 0295 $519.
Mercury/SE: DRI 0297 $389.
Gemini 20MHz: DRI 0301 $799.
Gemini 25MHz: DRI 0302 $999.
Plus Kit: DRI 0265 $129.



GUARANTEE

Many of our products come with a thirty day money back guarantee, if you are not completely satisfied. Ask for details when you place your order.

OVERNIGHT DELIVERY ONLY $3.00



Tempo II Plus (Affinity)
Tempo II, like all macro makers, has a record/playback caability. But Tempo II is smarter than most. It offers conditional branching, and can pause for specified time intervals, or to ask for user input. The new version adds 24 open architeture Externals, dropdown macro menus, and a full macro viewer.
UTI 0198 $105.

ENT0264 BlackJack Ace 27.
Electronic Arts
ENT0355 Harpoon 39.
ENT0319 Starflight 39.
Sir Tech Software, Inc.
ENT0346 Bane of the Cosmic Force 35.
ENT0347 Wizardry II: Knight of Diamonds 29.
Spectrum HoloByte
FACES, TETRIS, Welltris ea. 25.
The Software Toolworks
ENT0281 Chessmaster 2100 32.
ENT0278 Life & Death 32.
ENT0269 The Hunt For Red October 20.
Three-Sixty
ENT0323 Sands of Fire 32.
XOR Corporation
ENT0274 MacGolf Classic 52.

FONTS & APPPLICATIONS

Adobe Systems, Inc.
FON0264 Adobe Type Manager 2.0 59.
FON0351 Adobe Type On Call NEW! 47.
Adobe Type Set 1 or 2 ea. 65.
FON0326 Adobe Type Set 3 129.
Smart Art I, II, III or IV ea. 65.
DAC0028 TypeAlign 65.
FON0295 Adobe Type Reunion 45.
Altsys
FON0183 Art Importer 2.0 89.
FON0014 Fontographer 3.2 269.
FON0284 Metamorphosis 2.0 89.
Broderbund
GRA0156 TypeStyler 119.
Dubl-Click
FON0081 MenuFonts 3.0 31.
Pacific Data Products
INP0153 Pacific MacPage 529.
Post Craft
DTP0062 Effects Specialist 115.
QMS
UTI0169 UltraScript 119.
Tactic Software
FON0265 ArtFonts 49.
TeleTypesetting
FON0343 T-Script 92.
FON0357 T-Script Basic 55.



GRAPHICS & MULTIMEDIA

3G Graphics
GRA0188 Images with Impact! Accents & Borders 1 65.
GRA0111 Images with Impact! Business 1 65.
GRA0257 Images with Impact! People 1 95.
Abracadata
CAD0032 Design Your Own Home-Architecture 65.
CAD0033 Design Your Own Home-Interiors 65.
Adobe Systems, Inc.
DTP0054 Illustrator 3.0 (w/ ATM 2.0) 389.
GRA0125 Streamline 2.0 129.
GRA0191 PhotoShop 579.
Aldus
GRA0264 Freehand 3.0 399.
Baseline Publishing
GRA0242 Color MacCHEESE 59.
GRA0239 Master Color 99.
GRA0238 Master Paint 51.



Timeslips III 2.0 (TimeSlips Corp.)
The ultimate time tracking and billing software system invented for the Mac. New version 2.0 packs a time and expense program, a desk accessory stopwatch, generates hourly and flat fee charges , performs accounts receivable and contains invoice and report formats. Also has the capacity to handle big jobs: 250 users, 250 activities, 34,00 clients, 128 matters and a 32,000 character description field.
BUS 0043 $195.

TAL
Extend the Power of Timeslips with or without a general ledger accounting software with Timeslips III accounting link (TAL). Acquire the capability to link billing and payment data from Timeslips III to most general ledger and accounting programs. **FIN 0129 $55.**

Bright Star Tech, Inc.
GRA0161 interFACE 249.
Claris
CAD0029 ClarisCAD 2.0 645.
GRA0118 MacDraw II 289.
GRA0117 MacPaint 2.0 90.
Creative Software
GRA0240 Easy Color Paint 2.0 47.
Deneba Software
GRA0075 Canvas 2.1 189.
GRA0187 UltraPaint 125.
Dream Maker
GRA0105 Cliptures Vol 1 Business Images 69.
GRA0124 Cliptures Vol 2 Business Images 69.
GRA0219 Cliptures Vol 3 Sports 69.
GRA0101 MacGallery (Hypercard version) 27.
GRA0102 MacGallery (MacPaint version) 27.
Electronic Arts
GRA0106 Studio/8 189.
GRA0231 Studio/32 449.
Farallon™ Computing
GRA0221 MediaTracks™ 189.
GRA0222 MediaTracks™ Multimedia Pack 319.
Graphsoft
CAD0024 Blueprint 219.
CAD0030 MiniCAD+ 3.0 595.

Multi-Ad Search (Multi-Ad Services)
Find ellusive graphics files fast! Multi-Ad Search catalogs and retrieves all your graphic images. Specially designed for the professional production environment, it supports multiple users simultaneously. It stores color and b/w still images in all formats, and can search on keywords, filenames, types, volumes, and expiration dates. Multi-Ad Search displays images as thumbnails or in actual size.
UTI 0199 $125.

Innovative Data Design
CAD0039 MacDraft 2.1 299.
GRA0104 Dreams 1.1 429.
Letraset
GRA0151 ColorStudio 619.
DTP0019 ImageStudio 1.5 139.
MacroMind
GRA0140 MacroMind Director 2.0 629.
Metro Image Base (Full line available)
GRA0169 Newsletter Maker 85.
Paracomp
GRA0235 FilmMaker 435.
GRA0233 Swivel 3D Professional 435.
GRA0234 SwivelArt 82.
Praxitel
UTI0211 Read My Lips 75.
Silicon Beach
GRA0092 Digital Darkroom 2.0 259.
GRA0131 Super 3D 2.1 339.
HYP0027 SuperCard 1.5 199.
GRA0112 SuperPaint 2.0 135.
Solutions, Inc.
DAC0002 SmartScrap & The Clipper 2.01 56.
Strata
GRA0176 StrataVision 3D 349.
Strategic Mapping, Inc.
GRA0227 Atlas MapMaker 4.5 369.
Studiotronics
GRA0189 Colorset 1.5 179.
SuperMac
GRA0253 PixelPaint 2.1 149.
GRA0249 PixelPaint Professional 2.0 465.
T/Maker Co.
GRA0209 ClickArt Business Cartoon 33.
GRA0039 ClickArt Business Image 32.
GRA0088 ClickArt EPS Illustrations 82.

FastCache IIci (Daystar)
DayStar's Mac IIci Upgrades. Now even more power from Daystar! This New generation of cache cards allows you to plug even more speed into the Mac IIci chache slot. From the proven 64K Fastchache IIci up to the "blazing fast" performace of the new 50 MHz Power Chache IIci-get the speed you need at a price you can afford. And, no matter which board you buy now, you can always upgrade to the top of its line later-direct from DayStar! See listings for pricing.
DRI0224 (FastCache IIci) $289.
DRI0290 (PowerCache IIci) $1699.

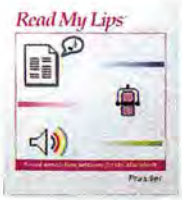




Stylist
Lets you use the full power of Microsoft Word 4.0 by taking the mystery out of style sheets. Displays and prints style settings and samples in beautifully organized windows and reports. Includes auto-formatting templates and dictionary of computer terms. **WRD 0033 $51.**



VocabuLearn/ce 2.0
A dynamic, computer-enhanced foreign language learning system for the Mac. This versatile, interactive HyperCard stack is available in five languages and two levels. Includes two 90-minute audio cassettes, plus a convenient word list with over 1500 useful words and expressions. **$35. ea.**



Read My Lips
Attach sounds to documents you create using popular word processors, desktop publishing, and presentation software. Use pre-recorded sounds or record your own. Both the built-in microphones of the new Macs as well as MacRecorder are supported. **UTI 0211 $75.**

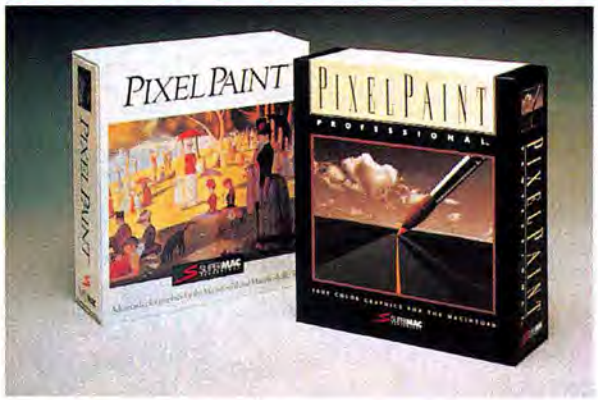
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PixelPaint 2.1 (Super Mac)
Gives full color paint capability to the artist who is just getting started on the Mac. Create images with the variable brush and pencil strokes, or import scanned images as templates. You can alter sizes, colorize, and add special effects. **GRA 0253 $149.**

PixelPaint Professional 2.0
Uses virtual memory to open and scrool through large and multiple documents. Its new 8-bit masking tool permits semi-transparent masking from any brush, tool, or image. Image processing tools let you adjust color, contrast, and brightness. **GRA 0249 $465.**



GraceLAN (Technology Works)
Scan and profile every Macintosh, printer, PC, monitor, NuBus Card, network peripheral or SCSI device on any size network without ever leaving your desk. GraceLAN allows you to identify system and memory configuaration, software versions, desk accessories, INIT's, printer drivers and much more. Sort, Filter, Export, Report, File, and perform a complete hardware/software inventory, without depending on mail or database programs. **50-User: NET 0117 $219.**

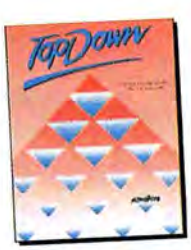


MacPrint 1.2
Easy-to-use software utility that lets you use most Mac applications with any HP LaserJet, DeskJet or compatible printer including the Series III. Prints text and graphics at the printer's maximum resolution, but does not support Postscript. Cable is included. **UTI 0098 $95.**



NewsletterMaker Vol.1

Electronic Clip Art
Communicate more effectively with fabulous art and graphics from the world's largest publisher of clip art. Each of the 18 ImageBase packages contains at least 100 topic-related images drawn by professional artists. (digitized at 300dpi or in EPS format). **GRA 0169 $85.**



TopDown 2.0
Lets you create great looking flowcharts, organization charts, process flows, documentation sheets and training materials quickly and easily. Instantly write, draw and update your diagrams. Hide or show details in a hierarchy of drawing levels. **BUS 0100 $219.**

Zedcor
GRA0199 DeskPaint 3.3 115.

HARDWARE & PERIPHERALS

Caere
INP0143 Typist 479.
CoStar
INP0091 LabelWriter 185.

CasinoMaster (Plus/SE) & Deluxe Mac II Version (Centron Software)
Let it Ride! You can bet on having hours of fun with Casino Master's five exciting casino games. Includes **Blackjack, Ace, Crapsmaster, Roullette Master, Pokermaster and Baccarat Master**. Exact table simulation, mouse controlled betting, selectable bankroll, stored win/lose statistics and complete manual included in full color! An odds-on favorite with professional gamblers. Individual games **$27.** each./5 game Casino Master Package **ENT 0277 $45.** Deluxe Mac II version **ENT 0289 $49.**

New! Black Jack Strategy Tester
Includes **Free** copy of Black Jack Ace! Test your betting and playing strategies over thousands of hands. Card counting, 1-8 decks, 1-7 players. Go off to the casino with confidence! **ENT 0329 $65.**



Epson
INP0167 Epson EPL-7500 Laser Printer 2599.
INP0168 Epson EPL-7000 Laser Printer 999.
INP0173 Epson PostScript Kit 1599.
MegaGraphics
MON0015 8-bit 19" Hi-Res Greyscale for Mac II ... 1895.
MON0016 8-bit 19" Hi-Res Greyscale for SE/030 1899.
MON0006 Rival System for Mac II 1199.
MON0008 Rival System for Mac SE 1199.
MON0007 Rival System for Mac SE/30 1199.
Microtek
INP0162 TrueLaser Printer 2019.
Seikosha
INP0041 Seikosha SP 2000 AP Printer 235.
Sharp
COMP007 Wizard OZ 7000 (32KRam) 229.
COMP018 Wizard OZ 7200 (64KRam) 255.
ThunderWare
INP0116 LightningScan 400 385.
INP0007 ThunderScan Plus 199.

INPUT & OUTPUT

Abaton
INP0157 Scan 300/Color 1899.
INP0164 LaserScript Printer LX 1759.
Asher Engineering
INP0051 QuadLynx Trackball ADB(SE/II) 59.
INP0158 Pocket Mouse 49.
CH Products
INP0121 RollerMouse ADB 75.
Curtis
INP0141 MVP Mouse 89.

Datadesk International
INP0097 DataDesk Switchboard 159.
INP0047 Mac 101 Keyboard SE/II 129.
Digital Vision, Inc.
GRA0145 Computer Eyes B & W 199.
GRA0154 Computer Eyes For Mac-Color 349.
ICD
INP0095 Graflex 82.

Kensington
NP0059 Turbo Mouse 109.
INP0060 Turbo Mouse ADB (SE or II) 109.
Key Tronic
INP0156 MacPro Plus 145.
Koala
INP0127 MacVision 3.0 269.
Kraft
INP0094 Kraft ADB Trackball 79.
Microspeed
NP0126 MacTRAC ADB 75.
INP0140 MacTRAC DB9 62.
MicroTouch
INP0084 The UnMouse 189.

Meeting Maker (ON Technology, Inc.)
A Macintosh network application that helps you plan,schedule and confirm meetings. You can schedule a time and date, select required guests, reserve rooms and resources and prepare agendas. Meeting Maker also has a personal calendar that allows you to block out activities, meetings, private work sessions, even recurring weekly or monthly appointments in a single step. You can also print your calendar in popular day-planner formats. **5-User BUS 0165 $325.; 10-User BUS 0166 $595.**

Mouse Systems
INP0132 Little Mouse ADB 75.
INP0134 Trackball / ADB 69.
Sophisticated Circuits
ACC0535 Power Key 65.

MEMORY UPGRADES & ACCELERATORS

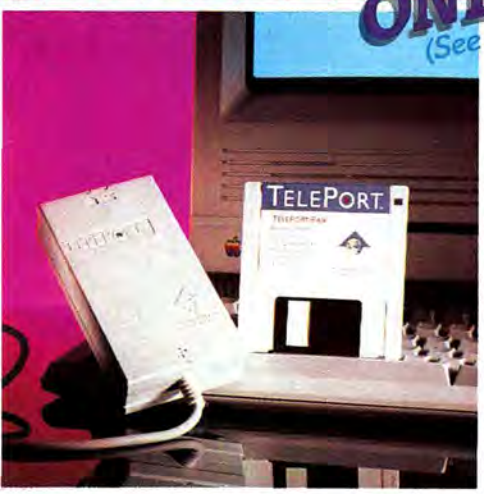
1 MEG SIMMs Low profile, 100ns, High Quality 59.
Daystar Digital
DRI0224 FastCache IIci 289.
DRI0288 PowerCache - 40 MHz (IIci) 979.
DRI0290 PowerCache - 50 MHz (IIci) 1699.
PowerCard 030 starting at 1495.
Connectix
UTI0144 Virtual 030 UM3 115.
DRI0185 Virtual 2.0 PMMU 188.
Dove
DRI0130 MaraThon 030 (MacII) w/Virtual 529.
DRI0198 MaraThon 030 - (Mac SE) w/ Virtual 529.
DRI0197 MaraThon 030 - (MacPlus) w/Virtual 529.
DRI0152 MaraThon 030X (MacIIx) w/ Virtual 529.
DRI0151 MaraThon 030-SE/030 w/ Virtual 529.
Micron Technology
DRI0321 PicturePress Card (Xceed ICDP-II) 745.
MicroTech International, Inc.
CHP0025 Mac Classic 1 Meg Upgrade 79.
CHP0026 Mac Classic 3 Meg Upgrade 179.
DRI0315 Mac Classic Upgrade Kit 20-1 399.
DRI0317 Mac Classic Upgrade Kit 40-1 499.
DRI0318 Mac Classic Upgrade Kit 40-3 575.
PowerUser
CHP0013 1 Meg Simm 100ns PowerUser 59.





GUARANTEE

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TelePort, the ADB Modem (Global Village Communication)
The perfect choice for powerful yet compact Mac communication. This 2400 baud modem with MNP5 data compression packs Hayes compatibility and error-free communication. TelePort plugs into your mouse (ADB) port and provides a pass-through connector for other devices. It uses no external power supply, and leaves your serial port free for other uses!
MOD 0049 $145.
Also, TelePortFAX includes SendFAX 9600 baud modem software. Hold OPTION as you drag FILE-PRINT to easily send FAXes worldwide.
MOD 0058 $189.



Total Systems
DRI0295 Mercury 16MHz 68030 - Plus 519.
DRI0297 Mercury 16MHz 68030 - SE 389.
DRI0299 Mercury SCSI Module - Plus 189.
Gemini- Full Line Available
DRI0301 Gemini 20 MHZ Card 799.
DRI0302 Gemini 25 MHZ Card 999.
DRI0265 Gemini Plus Kit 129.

MODEMS & FAX

Abaton
MOD0019 InterFax 12/48 265.
MOD0034 InterFax 24/90 349.
Applied Engineering
MOD0054 DataLink/Mac 209.
Dove
MOD0038 DoveFax Desktop 299.
Global Village
MOD0049 TelePort 2400 ADB Modem 145.
MOD0058 TelePort/Fax 9600 189.
Hayes
COM0023 Smartmodem 2400 349.
MOD0017 Smartmodem 9600 (V series) 699.
MOD0060 Personal Modem 2400 w/Smartcom II ... 179.
MOD0059 Ultra 96 w/ Smartcom II 929.
Microcom
MOD0050 MacModem V.32 / 9600 689.
PowerUser™
MOD0043 PowerUser 2400 99.
MOD0047 PowerUser Mini Send Fax 2400/9600 149.
MOD0062 PowerUser 24/96 Mini Send/Receive Fax Modem 199.
Prometheus
MOD0046 ProModem 24/96 MSR 299.
MOD0052 9600M Plus Modem 699.
MOD0033 Promodem 2400 MFax 209.
MOD0035 TravelModem 199.
Shiva
NET0067 NetModem V.32 (9600) 1169.
Supra Corporation
MOD0020 SupraModem 2400 119.

MUSIC & SOUND

Altech Systems
MUS0032 ALTECH MIDI Interface 59.
Coda Music Software
MUS0044 Finale 549.
Electronic Arts
MUS0004 Deluxe Music Construction 2.5 85.
Farallon™ Computing
MUS0036 MacRecorder® 2.0 159.
Opcode Systems
MUS0083 MIDI Translator 43.

Praxitel
UTI0211 Read My Lips 75.
Tactic Software
Sound Clips Vol. 1, 2, 3 & 4 ea. 49.

SECURITY & VIRUS PROTECTION

ASD Software, Inc.
UTI0135 FileGuard 2.5 139.
UTI0130 FileGuard 2.5 - Office Pack 5 349.
UTI0131 FileGuard 2.5 - Office Pack 10 579.
ACC0539 MaccessCard Reader 299.



PowerUser™ External Hard Disk Drives (Power User, Inc.)
Made to our exacting specifications by a leading manufacturer. They offer everything you always wanted in a hard disk for your Mac. All PowerUser drives come to you pre-formatted with a current System Folder installed - ready to use right out of the box. PowerUser drives have a rear panel SCSI address selector switch, two 50-pin SCSI connectors, and removable internal SCSI terminators for your convenience. Manufacturer's one-year warranty. **See line listings for prices.**

Fifth Generation System
UTI0120 DiskLock 118.
Kensington
ACC0235 Apple Security Kit 34.
PassProof 69.
Kent Marsh
UTI0028 MacSafe II 107.
UTI0064 NightWatch 1.03 86.
Microcom
UTI0093 Virex 59.
UTI0150 Virex 10-pack 359.
Symantec Corporation
UTI0214 Symantec Antivirus for Mac 3.0 (SAM) 67.

Stepping Out II (Berkeley Systems)
Turn your Mac screen into a window on a larger "virtual" screen. See any part of your document simply by moving the mouse. No more scrolling or tedious redrawing. Zoom out to see it all, zoom in for detail work. It also has a fixed menu bar and tool palettes, plus 75% reductions.
UTI 0074 $55.



After Dark 2.0
Prevents screen burn-in and does it with style. Choose from lightning bolts, meteors, abstract art, crawling worms, a jump to light speed, or a basic dimmer. New 2.0 modules include a special version of Fish!, plus Flying Toasters, Super Nova, and Spotlight.
UTI 0119 $24.

UTILITIES & PROGRAMMING

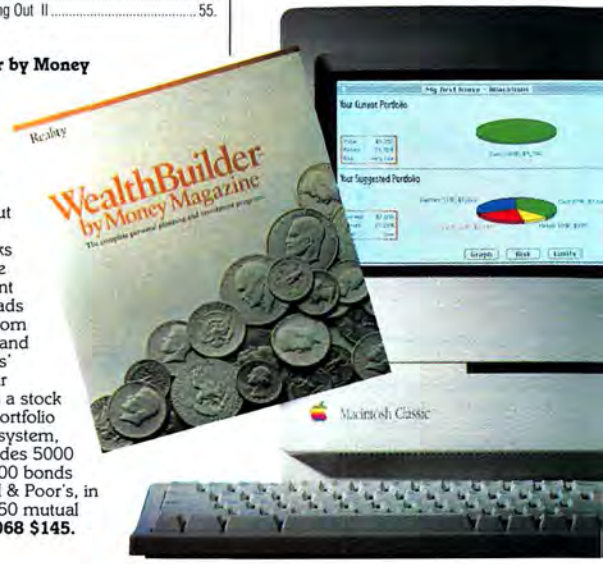
Abbott Systems, Inc.
UTI0113 CanOpener 62.
Affinity
UTI0198 Tempo II Plus 105.
Aladdin Systems
UTI0145 StuffIt Deluxe 63.
ALSoft
UTI0132 DiskExpress II 2.04 w/MultiDisk 57.
UTI0110 MasterJuggler 1.5 57.

Retrospect 1.2 & Retrospect Remote1.2 (Dantz Development)
Use your AppleTalk network for fast, automatic, unattended backup. At any time of the day or night your choose, Retrospect Remote goes from Macintosh to Macintosh and scans every hard disk—performing an incremental backup for your entire network to one tape, optical, or cartridge drive. Supports 10 remote Macintoshes; add more with Remote 10-Packs. For individual workstations, Retrospect 1.2 provides full, incremental, or compressed backups just by clicking a "Backup" button.
UTI 0118: Retrospect 1.2 $148.
UTI 0196: Retrospect Remote 1.2 with 10 Pack $275.

CE Software
UTI0188 Quickeys 2 v.2 97.
Connectix
UTI0148 HandOff II 57.
Custom Applications
UTI0136 Freedom of Press 3.0 255.
UTI0185 Freedom of Press Light 3.0 55.
Dantz Development
UTI0118 Retrospect 1.2 148.
UTI0196 Retrospect 1.2 Remote 275.
Digitalk, Inc.
LNG0036 Smalltalk/V MAC 125.
Dubl-Click
UTI0194 ClickChange 41.
Fifth Generation Systems
UTI0063 FastBack II 2.5 125.
UTI0087 SuitCase II 1.2 49.
UTI0035 SuperLaserSpool 2.02-Single User 93.
ICOM Simulations, Inc.
UTI0084 On Cue 35.
Insight Developement
UTI0098 MacPrint 1.2 95.
Magic Software
UTI0077 Autosave II 28.

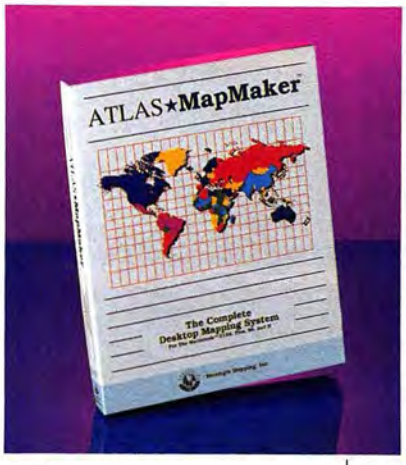
American Power Conversion
UTI0133 Power Chute 69.
Baseline Publishing
UTI0187 INIT Manager 35.
UTI0190 Personality 49.
UTI0183 ScreenShot 31.
Berkeley System Design
UTI0119 After Dark 2.0 24.
UTI0074 Stepping Out II 55.

WealthBuilder by Money Magazine (Reality Technology)
WealthBuilder uses your financial data and your decisions about goals and acceptable risks to calculate the best investment strategy. It reads data directly from both Quicken and Andrew Tobias' Managing Your Money. It has a stock tracking and portfolio management system, and now includes 5000 stocks and 5000 bonds from Standard & Poor's, in addition to 1450 mutual funds. **FIN 0068 $145.**



CompuServe

You can now contact MacWAREHOUSE or place orders with us in the **Electronic Mall** on CompuServe. The **MacWAREHOUSE GO code** is **GO MW**. As always, you'll get fast, dependable overnight service and you can leave messages for Kerry or any of our support staff.



Atlas MapMaker 4.5 (Strategic Mapping)
A complete desktop mapping system that lets you quickly display the relationships in geographic data with striking color presentation graphics. Includes everything you need to map the U.S. by state or county, the world by country and much more. Use the U.S. Census statistics included with the program, or choose from a library of data and map files provided. Also read in Zip Coded name and address files and display their map locations, or combine their data into useful information of target marketing, customer analysis, distribution planning, and sales-territory design. **GRA 0227 $369.**

Magna
UTI0166 Empower I 89.
UTI0146 Empower II 155.
Mainstay
UTI0073 Capture 3.0 45.
UTI0189 MacFlow 3.5 175.
Microcom
UTI0191 Microcom 911 Utilities 89.
Microsoft
LNG0030 QuickBASIC 64.
Multi Ad Services
UTI0199 Multi Ad Search 125.
Now Software
UTI0167 Now Utilities 2.0 79.
UTI0168 Screen Locker 45.



MacSpin 3.01 (Abacus)
The only Eddy Award-winning exploratory data analysis and visualization program for the Macintosh! MacSpin helps you understand the meanings behind the patterns and associations in your data. By graphically depicting data in a 3-dimensional space and viewing it from any angle, the user can discover revealing distributions, subsets, and influential outlines in their data. Animation and color allow for higher dimensional representation. MacSpin's comprehensive array of visualization tools facilitates the development of visually-based hypotheses. **STA 0006 $185.**

ON Technology
UTI0142 ON Location 75.
Salient
UTI0179 DiskDoubler 3.1 45.
SNA
UTI0207 Offline 51.
SuperMac
UTI0203 DiskFit 2.0 59.
Symantec Corporation
UTI0151 Norton Utilities for the Mac 89.
UTI0078 Symantec Utilities for Mac II (SUM) 99.
LNG0001 THINK's C 4.0 165.
LNG0002 THINK's Pascal 3.0 165.
Zedcor
LNG0031 ZBasic 5.0 99.

FileGuard 2.5 (ASD)
Protect your Hard drives and Partitions from unauthorized access (including security bypass with a system diskette), copying and erasure; Applications and Files/Folders (including system folder) from unauthorized access, deletion, and/or illegal copying; Desktop (including system folder) from alterations by unauthorized users; Keep an eye on System Usage with the system users log which continuously tracks user/group activity. **Single UTI 0135 $139. Office 5 Pack UTI 0130 $349. Office 10 Pack UTI 0131 $579.**

WORDPROCESSORS & SPELLING CHECKERS

Ashton-Tate
WRD0009 FullWrite Professional 1.1 SPECIAL! 59.
Baseline
SPL0029 Thunder 7 59.
Caere
UTI0164 OmniDraft 69.
UTI0100 OmniPage 2.1 495.
UTI0163 OmniSpell 69.
Claris
WRD 0026 MacWrite II 139.
DeltaPoint
WRD0032 Taste 99.
Deneba Software
SPL0015 Spelling Coach Pro. 3.1 124.
Lexpertise
SPL0003 MacProof 3.2.1 115.
Microsoft
WRD0022 Word 4.0 245.
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WRD0031 RightWriter 55.
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SPL0018 Sensible Grammar 51.
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shadows, but when you do it correctly, it can add a touch of class to your layouts. Here's a way to create embossed text in Adobe Illustrator, but the basic technique should work in a variety of programs:

1. Create a box containing a background shade (in Figure 2, I've used a 50-percent black tint).

2. Type the text inside the box. It's best to use a heavy type style, such as Helvetica Black or Stone Sans Bold.

3. Copy the text to the Clipboard. Paint the text *lighter* than the background (say, 25-percent black). Using the arrow keys, move the block of text left and then up the same amount of space (in the example, I pressed the left arrow three times and the up arrow three times).

4. Use the Paste to Front command (Command-F) to place the Clipboard text in the box. Paint this text a shade that's *darker* than the background shade (say, 75-percent black). Using the arrow keys, move this text block down and to the right the same number of spaces as before.

5. Use the Paste to Front command to place another copy of the Clipboard text in the box, and paint it the *same* color as the background. Preview the image (Command-Y), and you'll see the embossed effect. You may need to go back to the image and tweak the number of spaces you've moved each copy of the text to get the best effect.

Using the same technique, you can make simple EPS clip art look embossed.

Steve Godun
Piscataway, NJ



Figure 2: Give your work that touch of class with embossed text. This effect was created with Adobe Illustrator 3.0.

ResEdit

Here's a real-world use of ResEdit along the lines of the tips in the December '90 Beating the System column ("Return to ResEdit," page 273). If you've ever tried to type P.O. Box quickly on a typical Mac keyboard, you've probably wished that the Mac keyboard functioned more like a traditional typewriter, with Shift-



period producing a period (instead of >) and Shift-comma producing a comma (instead of <). Here's a way to reassign these keys, using ResEdit 2.1 or later:

1. Make a copy of the System file in the System Folder by using the Duplicate command (Command-D) on the File menu. Remove the copy to a nonboot disk or partition (having two System files on your boot disk can cause problems).

2. Open the copy with ResEdit, and open the KCHR resource, which controls the mapping of ASCII characters to keyboard keys (see Figure 3).

3. The keyboard display in the bottom third of the window changes as you press the modifier keys, in the same way as it does with the Key Caps DA. Hold down the Shift key to display the shifted keyboard map.

4. Using the mouse, drag the desired character (in this case, the period) from the palette in the top two-thirds of the window onto the key you want to represent it. Do the same with the comma. (Because this operation replaces the > and < symbols with the period and comma, you might want to assign the < and > symbols to the Option-Shift positions on their respective keys so they're still accessible.)

5. Close the KCHR resource, and save the changes to the System file. Restart the Mac from a floppy disk, store the old System file in some place other than the boot disk, and place the edited version of the System file in the System Folder. Restart the Mac. This will eject the floppy disk, and your Mac will reboot with the new System file in place.

This change affects the keyboard mapping, not the font information, so it should be font-independent.

Bill Arden
Minnetonka, MN

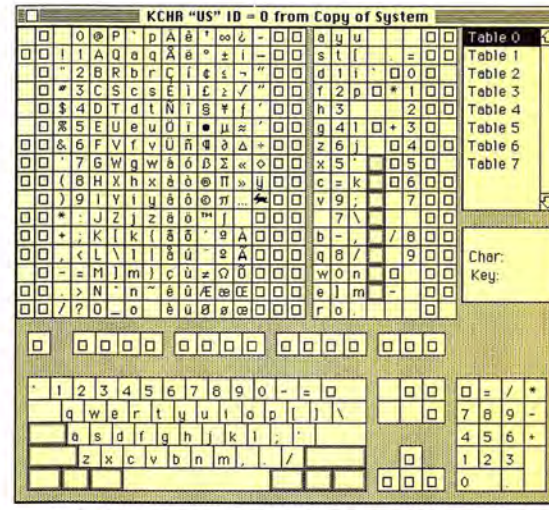
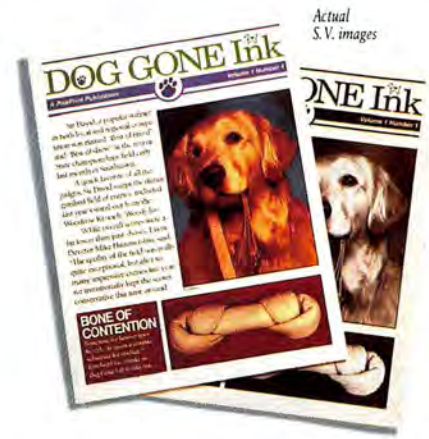


Figure 3: Remapping the Mac's keys is a simple matter of cut and paste when you use ResEdit to access the System's KCHR resource.

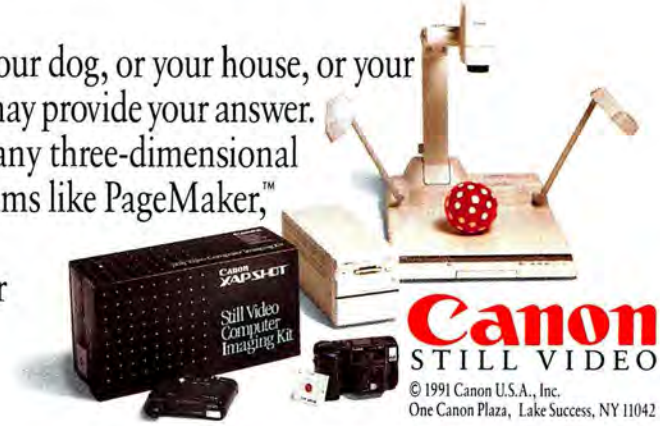




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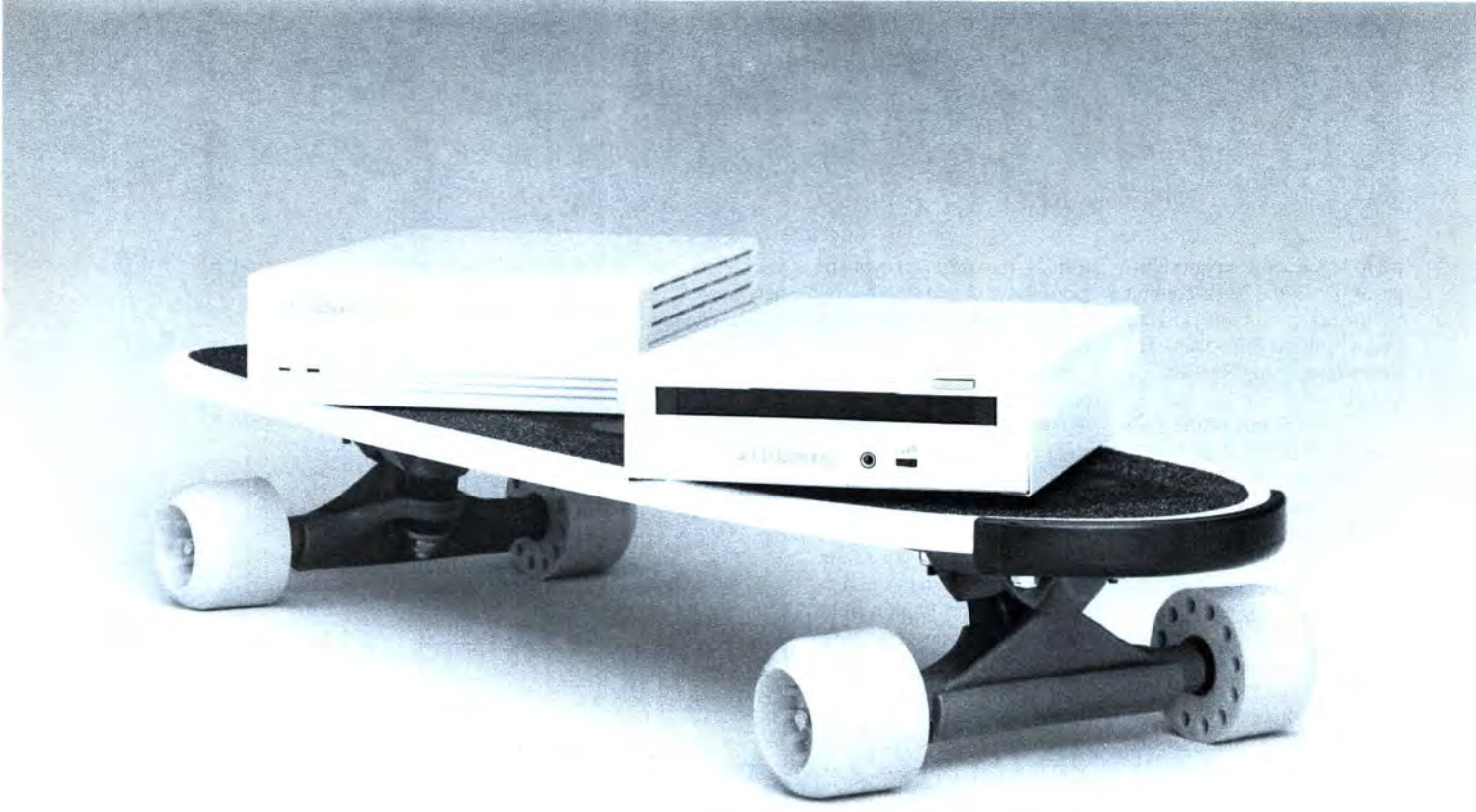
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By Bob LeVitus and Andy Ihnatko

The System Heap

Q. When I've accessed About the Finder on my Mac, I've noticed that the System bar is full. Is this what's known as the System heap? How do I go about increasing its size? If I have no free memory allocated within this System bar, will that cause problems or will my Mac compensate for it?

Dan Malin
Mount Vernon, WA

Bob: The System heap is one of the least understood and most frequently debated topics of Mac conversation. First a definition. The System heap is where all your fonts, DAs, INITs, cdevs, and Chooser devices reside. If you don't have enough memory allocated to the System heap, your Mac will slow down or even crash. You won't do any damage by making your System heap too large, although applications can't use the memory you assign to the heap.

If you don't add a lot of fonts, DAs, cdevs, or INITs to your system, the System heap's default setting is fine. However, if you've added lots of these goodies, you'll probably need to increase the System heap. How do you know whether or not you need to do this? A good rule of thumb is that if the System bar in the About the Finder bar graph is more than 75 percent dark gray, your System heap probably needs expanding (see Figure 1).

Unfortunately, Apple doesn't provide a tool for expanding the heap, nor does it adequately explain how to expand it anywhere in the Mac's manuals. Luckily for us, however, there are a lot of tools that let you expand your System heap. Among the low-cost options are Bootman (freeware); HeapTool (shareware);

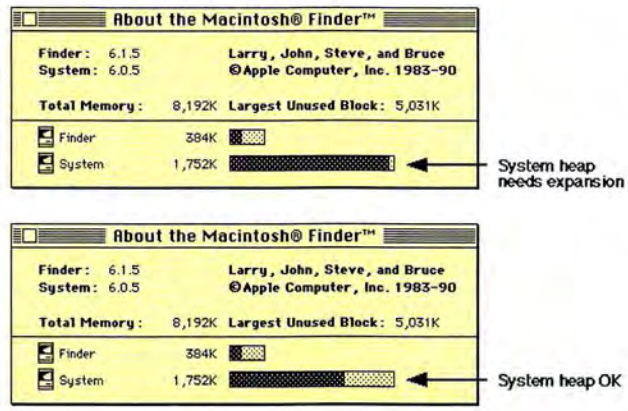


Figure 1: To find out if your System heap has enough memory allocated, look in About the Finder on the Apple menu. You should see 20 to 25 percent light gray in the System bar. If there's less, your heap probably needs expanding.

✻ . . . But Were Afraid to Ask

Who ever said there was such a thing as a stupid question? OK, my chem professor did, but he said it only to me. The only stupid question is the question you don't ask. Here at Help Folder, we don't care how simple you think your question is . . . just send it in! (However, if it's such a simple question that you're embarrassed to even ask it, we'll conceal your identity by crediting the question to a deceased historical figure.)

Q. Why is the Mac so afraid of a harmless little colon? If I want to save a file, I can make the filename a whole sentence and add circles, math symbols, *anything* except a simple colon! Why?

Adeodatus II
(papal reign AD 672 – 676)

Andy: Well, the colon is reserved for the Mac's own use, that's all. The colon helps designate the path the Mac operating system must walk through in order to get at a file.

For instance, if the Mac operating system sees Star Trek: The Next Generation: Episode 1, it doesn't see one simple filename. Instead, the Mac thinks, "There is a file named Episode 1 in a folder named The Next Generation located on a volume named Star Trek."

Nowadays, most Mac programs prevent you from incorporating a colon in a filename by giving you a savage tongue-lashing if you so much as try it. You'll probably get an Illegal-character-in-filename or Cannot-find-that-volume error message and will have to enter a new name.

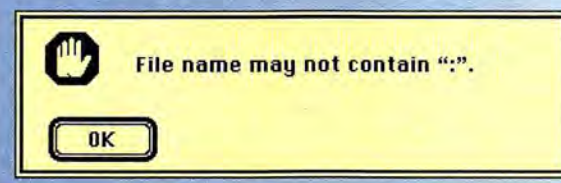


Figure A: Unlike some other applications, Microsoft Word is quite civilized in letting you know that filenames can't contain colons.

and HeapFixer, which CE Software includes with some of its products. Bootman includes excellent on-line help that explains all the subtleties of the System heap. As far as commercial products go, INIT Manager (Baseline Publishing) and Startup Manager (included in Now Software's Now Utilities) handle heap expansion elegantly and also provide sophisticated mechanisms for managing INITs.

Andy: I've had HeapTool running on my Plus for a month now, and I think it's fantastic. I haven't had a single crash since I installed it, and it takes much less time for applications to launch and quit. And just look at that shine on my no-wax floor!

With HeapTool, you control how big your heap is. With some of the commercial heap-wrangling INITs (such as Startup Manager), the program decides for itself how big the heap ought to be (by examining the memory requirements of all your INITs as they load). Another reason I like HeapTool is that it changes the heap space in memory at startup instead of rewriting part of the boot blocks on your startup disk (which is what stand-alone heap diddlers such as Bootman and HeapFixer do).

I secretly believe that every time you make changes to your boot blocks, a little buzzer sounds in Hades signaling that it's time for Clem, the minion in charge of clobbering hard drives, to make another house call. That's just a personal feeling, of course.

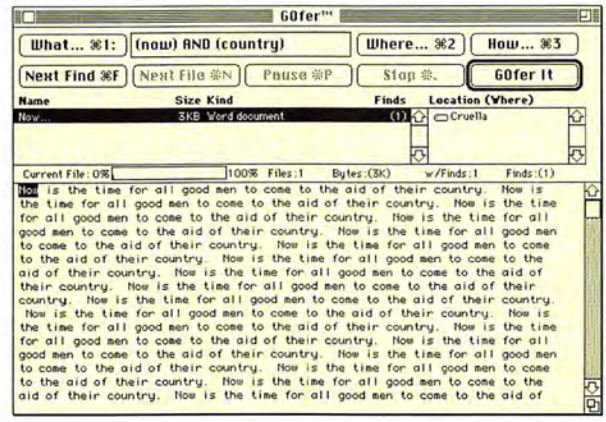


Figure 2: GOfer is a text-retrieval DA designed to search the contents of files created by almost any program. It can also function as a low-end database, searching your documents for quotes or references that you can then paste into another document.

Print Screen Stopped Working

Q. I recently purchased a Hewlett-Packard DeskWriter inkjet printer to replace my ImageWriter, and I've noticed that I can't use Command-



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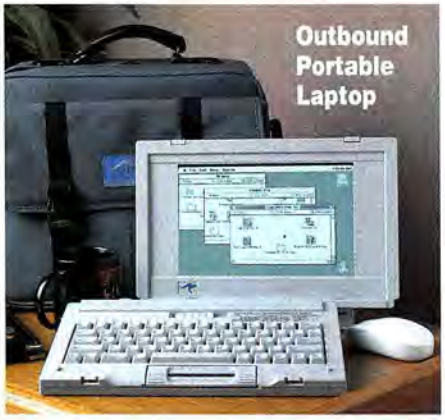
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Shift-4 anymore to print my active window to the printer. I rely on this option, because several of my programs don't have their own Print commands. Is there another way to print the screen?

M. R. Turtle
Goleta, CA

Bob: Actually, most 300-dpi printers — laser and inkjet — don't support Command-Shift-4, which sends the contents of the active window to an ImageWriter printer.

Never fear. Your Mac has a built-in print-screen-to-disk command. If you have a black-and-white monitor, Command-Shift-3 will create an editable and printable paint document of the current screen, not just the active window. The document appears on the Startup disk as Screen *X*, where *X* represents a number between 0 and 9, inclusive. You can take up to ten screen shots (Screen 0 through Screen 9) before you have to renumber them. Once you've created a document this way, simply open the file with MacPaint (or any program that reads MacPaint files) and print it.

If you have a color Macintosh system with System 6.x or earlier, Command-Shift-3 works only if your monitor is set to black-and-white (use the Monitors cdev in your Control Panel to do this). System 7.0 will let you create color screen images when you use Command-Shift-3.

Andy: It's a bummer, all right, but you do need special screen-printing utilities for any non-ImageWriter printer if you want to print the active window directly to the printer. The good news is that there are a lot of alternative screen-dump INITs and Fkeys out there. My own favorite is Nobu Toge's shareware Flash-It INIT/cdev (available from user groups, Zmac, or other shareware sources), which sends screen dumps to just about any printer. I wasn't able to determine whether Flash-It works with the DeskWriter, but it's certainly worth downloading it and giving it a whirl.

Index of Quotes and References

Q. Because I do a lot of writing and public speaking in my work, I would like to build an indexed library of quotes and references from the hundreds of books in my library. I'm trying to find a program I can run with Word under MultiFinder that will let me access all the quotes listed under a certain word or theme and then paste the desired quote into my document. Can you suggest a program or utility I should look into?

David B. Drake
Sunnyvale, CA

Bob: Most database programs can do what you ask. For example, FileMaker Pro, from Claris, is an easy-to-use, powerful database program that indexes each word in a text field so you can quickly locate records that contain any word in that field.

Another option, especially if you don't want to learn how to set up and use a full-blown database program, is a wonderful, inexpensive text-retrieval DA called GOfer, from Microlytics.

GOfer can search files created with most applications, including Word. It's also very flexible, to the point of supporting Boolean operators such as AND, OR, NOT, and NEARBY (see Figure 2).

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But the built-in word processing language isn't the only surprise in Nisus 3.0. It also has an integrated graphics capability that will let you do things that some layout programs can't such as rotate text, graphics, or even add arrows.

```
0025000G5001 50630D PANSOPHIC  PANVALET     001 50860C WEST      WESTI
001 51000K IBM      DL/1       001
A & M RECORDS              LOS ANGELES    CA90028   2134480037C365200275
000001000104
0025000G3006101298130IBM 4341-UNK      8601M ODOS-VSE      21298069IBM
3350       01610298058IBM 3420       00813298100IBM 4245       002
A & M RECORDS              LOS ANGELES    CA90028   2134480037C365200275
```

The sample above shows fixed length fields and fixed length records that are common in some mainframe files. That means you can not simply tell your conversion program to drop in tab or comma delimited spaces at the end of the text in each field. For most programs converting this would be complete chaos. And that's without eliminating the duplications and extracting just the information you want.

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Although it doesn't index entries, GOfer is relatively fast and requires significantly less RAM than a database program. GOfer also comes bundled with CE Software's excellent find/rename/move/copy/launch-files DA, DiskTop.

Andy: I agree 100 percent — GOfer is the ultimate solution to those "dangit, it's on a file *somewhere* on my hard disk!" blues. You *could* go to the trouble of creating a database of quotes, using a name-brand database program, but it'd be worth it only if you were, say, selling the database. Get GOfer, if only for the free copy of DiskTop!

Two Monitors Simultaneously?

Q. I bought a Mac Plus back when it was the top of the line, but now I'd like to upgrade to a Mac IIfx. I plan to start off with a two-page monochrome monitor and later, when I can afford it, get a second, smaller color monitor. Is it possible to arrange things so that I can have both monitors working simultaneously?

Marty Goodwin
Orlando, FL

Bob: Yes, yes, yes. One of the nicest features of the Mac II series is that you can have as many as six monitors hooked up at the same time (each one requires a separate NuBus card), and you can arrange them any way you like, using the Monitors cdev. To specify which monitor will show the Startup screen, choose Monitors from the Control Panel and hold down the Option key. When the Happy Mac icon appears, drag it to the monitor you want to specify as the main monitor and then reboot (see Figure 3).

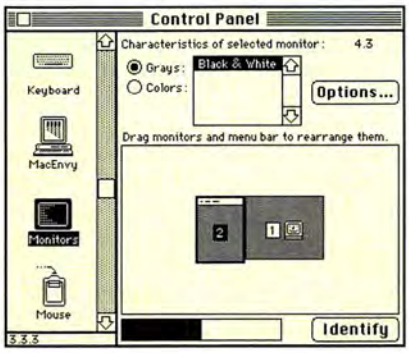


Figure 3: With the Mac II series, you can have up to six monitors hooked up at the same time. Drag the Happy Mac icon in the Monitors cdev window to the monitor you want to contain the Startup screen.

Andy: And there's another advantage to a multi-monitor setup. A pal of mine with three monitors says that if you angle them just right, you can bake a potato on your desk in less than 30 seconds.

Requiem for a 512K Mac

Q. I need some advice on upgrading a 512K Mac. I've asked dealers how much it would cost to upgrade to a Plus. They tell me I might as well buy a new Mac, but I'm not sure if they're just trying to get me to buy a new computer. My 512K is in great condition, and I don't want to just toss it aside. What can I do to bring old faithful into the 20th century?

Barbara Morgan
Whitehall, PA

Andy: Let me say right off the bat that the coolest upgrade

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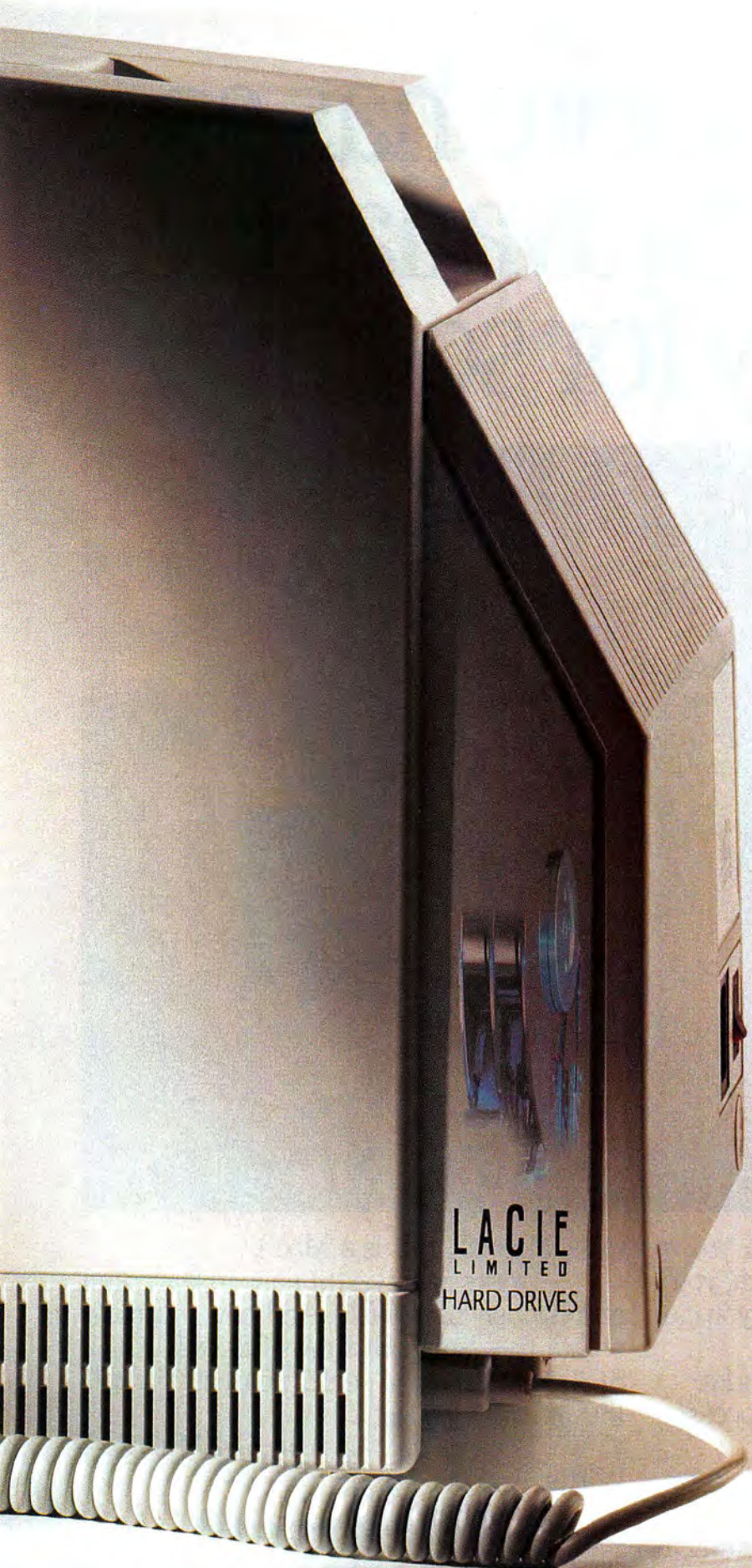
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kit I've ever seen for the 512K consisted of a set of clear acrylic panels and a light that let you turn your Mac into a working aquarium. It was at a trade show and was a little pricey as I recall, but to this day, I've wanted a Mac-Aquarium. As to what you can do to maintain your 512K as a useful member of the Mac family, well, I'll reserve comment for the moment and just present the facts.

Priority 1 is to upgrade your ROMs and internal drive, if you haven't done so already. An original Macintosh 512K has the old 64K ROM chips and a 400K internal drive, both of which are hideously out of date. You *need* an 800K drive, because, frankly, it's almost impossible to find software on 400K floppy disks. You also need the newish 128K ROMs, because without them you can't use *any* modern Mac software nor can you use the HFS (Hierarchical File System), which other Mac owners have taken for granted for several years now.

The cheapest way out is to buy an external 800K drive and to get hold of Apple's HD20 INIT (try your local user group). This is an almost-impossible-to-find INIT that shipped with Apple's original non-SCSI hard drive, and it imparts HFS features to any device hooked up to the external-drive connector. A few years ago, I tried this INIT on a 512K Mac and it *seemed* to work fine, but it's not the sort of solution I'd want to rely on for any length of time.

Priority 2 is to get more memory. These days, 1 megabyte is considered merely adequate; 2 or 2.5 megabytes is almost de rigueur. Face it, 512K of RAM is not going to get you very far. Although some software packages (WriteNow and Publish It! Easy, for example) don't need more than 512K of memory, most software will Trumpishly seize all the memory it can get its hands on.

Besides the necessities, there are certain optional extras. For example, you can live without a SCSI port, but it won't be a *pleasant* life, because any sort of mass-storage device for the Mac requires a SCSI port. On the other hand, you can certainly do without math coprocessors, accelerators, and 68030 processors. They speed up your Mac, but unless your work involves lots of savagely intricate calculations, the speed increase is generally pretty trivial, considering how much these upgrades cost.

So first the good news: All of the "must-have" items I've mentioned are attainable — at least they were when I wrote this. Although Apple no longer supports the 512K Macintosh, upgrades are still available through third parties. Firms such as Computer Care in Minneapolis ([800] 950-2273) can sell you a new drive and a set of ROMs (there isn't a constant supply of these, but you might get lucky) as well as memory and a SCSI-upgrade card. Some companies even sell upgrade packages that claim to make a Mac 512K as powerful as a IIfx!

Personally — and I stress that this is a personal opinion — I don't like upgrade cards. First, because the 512K and the Plus were not designed to accept expansion cards, these upgrades typically must be clipped onto the motherboard with a clothespin-like device.

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The clip tends to work itself loose every now and then, leading to system crashes and frayed nerves.

Second, the Plus and 512K power supplies are a little screwy to begin with and really don't appreciate the burden of all that extra acreage of circuitry. And finally, it really doesn't make any sense financially. By the time you've paid for the new drive, the new ROMs, and the upgrade card, you'll have spent about as much as you'd have spent to buy a used SE — or a brand-new Classic!

So here's what I'd do. Go ahead and sell your 512K Mac outright, and apply the cash toward the purchase of a more modern machine. As I write this, a used Mac Plus can be purchased for about $200 plus the revenue from the sale of a 512K. A used SE or a new Classic may cost as little as $750. It's a little more trouble, sure, but in the end, you'll have a *real* computer, not some kludged-together collection of daughterboards and Band-Aids!

And if all else fails, you might want to give that aquarium idea some thought too.

Get Info Comments Disappear

Q. I like the Get Info command, because it lets me add comments about what's in any file without having to open it. However, these comments were missing on several occasions when I tried to access Get Info. How can I make sure that the information stays put?

Rand Uehara
Niigata, Japan

Bob: This is one of our most frequently asked questions. We covered it in March and November of 1990 (pages 231 and 279, respectively). Since then we've found another couple of solutions, so it looks like it's time to answer this question again.

The Get Info comments are stored in the invisible Desktop file. When you rebuild the desktop, the comments disappear (to rebuild the desktop, reboot while holding down the Command and Option keys until a dialog box appears and asks you if you want to rebuild the desktop).

Because rebuilding the desktop is a routine maintenance procedure you should perform at least several times a year, you may think you're doomed to losing these comments each time, but it ain't necessarily so.

If you use Norton Utilities for the Macintosh, you already have one way of restoring your comments. Make sure you've installed the FileSaver cdev in the System Folder before you rebuild the desktop, and then use Norton's Format Recover option to restore Finder comments. Or you can use 1stAid Software's freebie Minor• Repairs, which rebuilds your desktop *and* restores your Get Info comments (see Figure 4).

Non-Apple Dot-Matrix Printers

Q. I own a Mac 512K and a Star Micronics SG-10 printer connected with a Star MacStar II interface. When I print, the first pass prints only the upper quarter of the letters and the second pass prints the rest of the letters.

I've fiddled with all the DIP switches without having any luck. Is there any way to get

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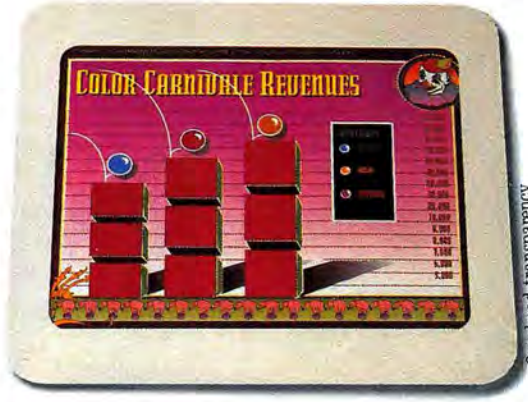
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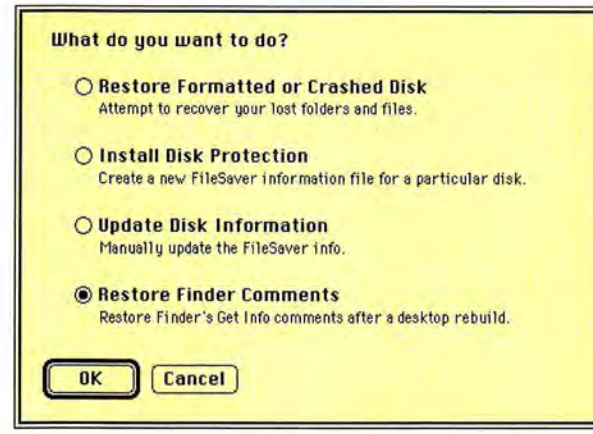


Figure 4: You don't have to lose Get Info comments every time you rebuild your desktop: Minor•Repairs (above) and Norton Utilities for the Mac (right) let you restore comments with the press of a key.

the printer to print the entire letter on the first pass?

S.D. Porterfield
Warner Robins, GA

Andy: I think that the problem is that you've been watching too many IBM printers lately. The Macintosh prints not by sending character codes to the printer but by sending a bit-mapped image (a series of actual dots) that represents what the text looks like, in its proper font, size, and style. Therefore, it's very likely that the print head isn't going to be able to print the entire height of the character in one pass and instead will take two passes to get it right. This isn't a defect in your printer or in the way the Mac works, and it shouldn't affect the quality of your printed output; as Mel Tormé has often said, it's just one of those things.

You'll get a lot of individual operational variations when you use non-Apple printers with the Macintosh. You may find, for instance, that the printer pauses for a second or two right in the middle of a line; this is nothing to worry about. The printer's built-in buffer can hold only half a line's worth of data, you see, and has to be spoon-fed by the Macintosh again before it can proceed.

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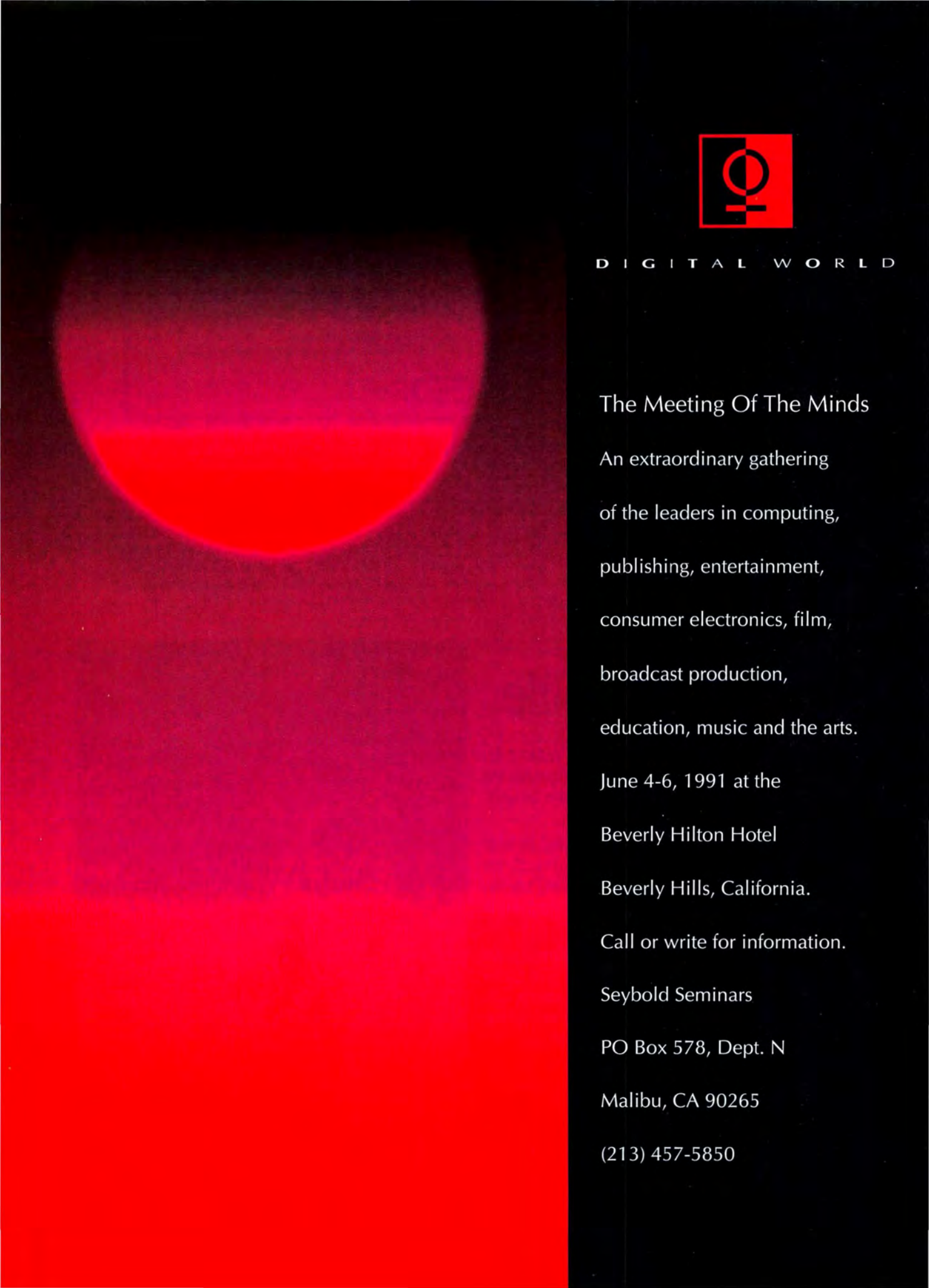
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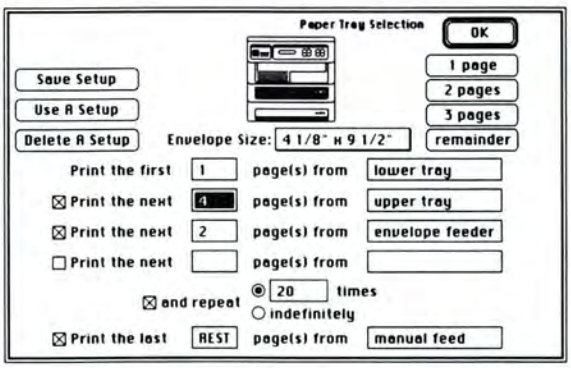
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What's so great about PostScript Level 2, anyway?

It's very, very fast (see chart on next page). Type characters are built 4 to 5 times faster, and text quality at small point sizes is greatly improved.

And why should I replace my old PostScript Level 1 printer now?

Existing PS Level 1 printers are on their way out. Buying a PostScript Level 1 printer today is like buying a MacPlus today — great in its time, but new technology has made it an inferior choice.

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61 sec.	100 sec.	119 sec.	241 sec.	251 sec.	301 sec.
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$1995	$3995	$4295	$1995	$1749	$1995

* *Statistics are provided by MWA Research Corporation, San Jose, CA. On average, the RT Laser performed 500% faster than the Apple Personal LaserWriter. This test was based on a seven-page newsletter. The 3-column document, created in PageMaker, included halftone photos and graphics.*

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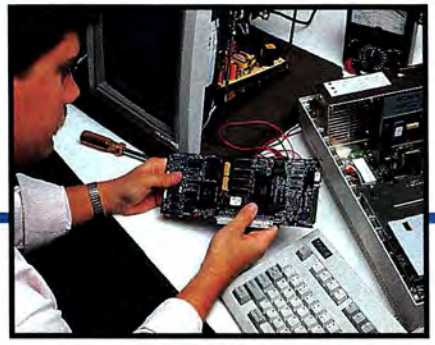
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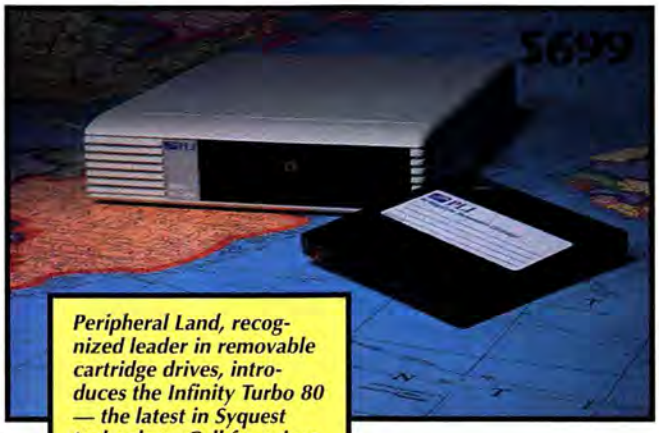
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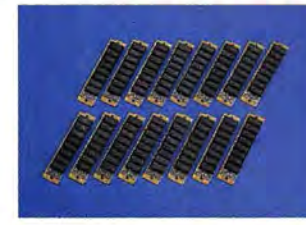
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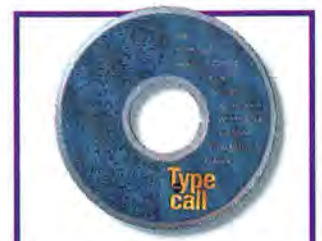
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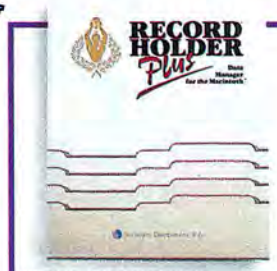
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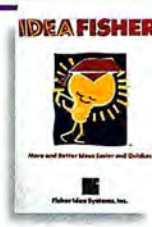
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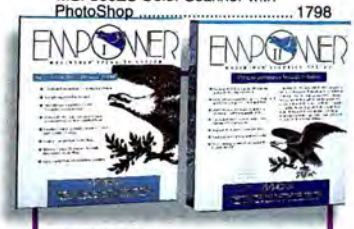
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- ☐ a) Mac Plus
- ☐ b) Mac SE
- ☐ c) Mac II
- ☐ d) IBM PC
- ☐ e) Other

2. For how many micro computers do you buy products?

- ☐ f) 1-4
- ☐ g) 5-49
- ☐ h) 50+

3. Your primary job function is: (check one)

- ☐ i) Administrative/General Management
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- ☐ p) Spreadsheets/ Financial Planners
- ☐ q) Project Managers
- ☐ r) Word Processors
- ☐ s) Database Managers
- ☐ t) Graphics
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- ☐ v) Communications

HARDWARE
- ☐ w) Mainframe
- ☐ x) Mini
- ☐ y) PC
- ☐ z) Printers/Plotters
- ☐ 1) Monitors
- ☐ 2) Disk/Tape Back-up
- ☐ 3) Add-in Boards
- ☐ 4) Communications

5. Are you involved in the purchasing of microcomputer equipment at your company?

- ☐ 5) Yes
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6. If so, what function do you serve in the buying process?

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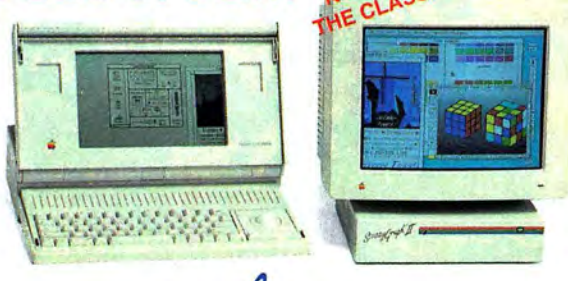
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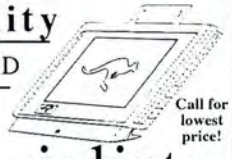
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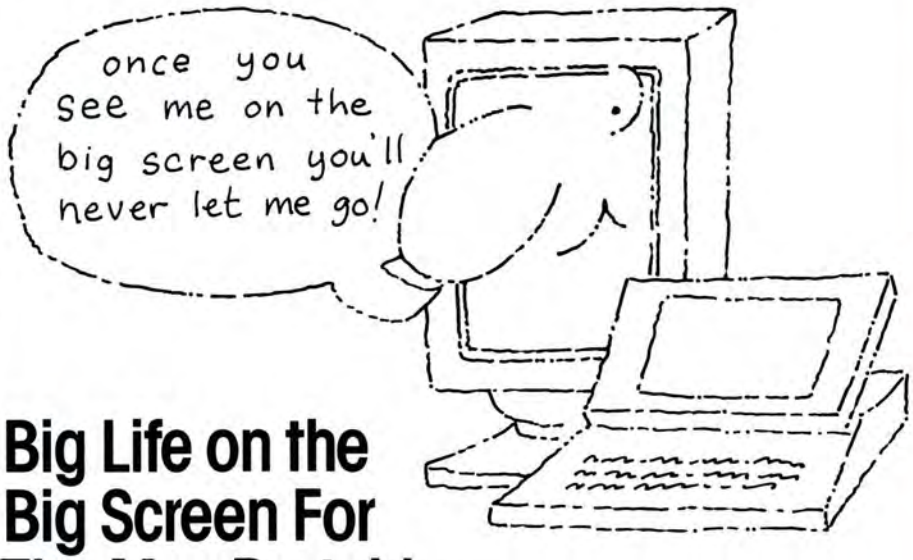
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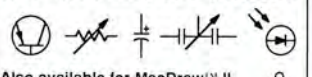
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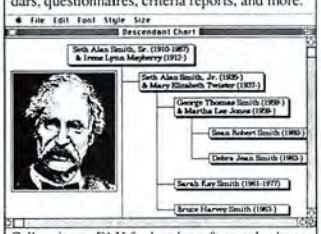
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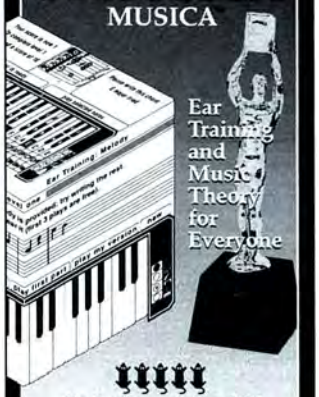
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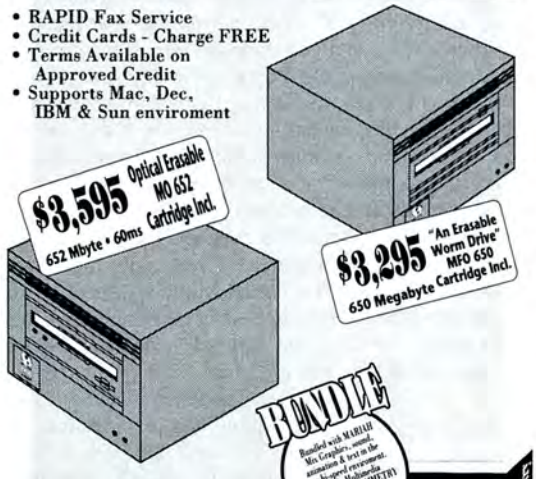
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Just Your Type



Mac users know that their memos are prettier than those of PC users, but they still miss the point — using type effectively requires more than just a pretty face.



ILLUSTRATION: ROBERT ZIMMERMAN

Typography is a form of communication. This simple fact is not understood by most computer users. Although many have managed to default their way into good taste, few do much more with their printers than pick one typeface and use it like a type ball on an IBM Selectric. No thought is given to the leading (the space between the lines), the point size, or even the occasion.

The occasion is a critical element in picking and choosing typefaces. You don't use the same typeface for a wedding invitation that you do for a letter to Mom or for a résumé. I think most people have figured out that much. But how many users realize that a memo to the boss should have a different typeface than a letter to a subordinate?

There is an aspect of privilege concerning the use of variable typefaces. When you're on an E-mail system, you probably have no control over the typeface or presentation, so no subtle message can be conveyed through typography. A memo ridiculing a proposal, for example, in which every letter is a clown contorted into a letter of the alphabet, cannot be done over E-mail. On the other hand, if you want to present a slick image of refined good taste, it's much easier to do with a laser printer, a few good fonts, and some knowledge of layout design.

This concept is nothing new, and it was not completely lost on typewriter designers. IBM figured out the importance of presentation and typefaces as communication when it introduced the IBM Executive typewriter in 1954. This typewriter used special fonts and implemented true proportional spacing long before anyone ever thought of PostScript.

Letters produced on an Executive had a flair that could not be matched by conventional typewriters. Some of the Executive's attributes were later adopted — but never equaled — by daisywheel-printer fonts.

Although it never could coax the Executive look from its popular flying-ball Selectric, introduced in 1961, IBM compensated for it by adding a variety of interchangeable balls — some more tasteful than others. For a short time, IBM even made an elaborate typesetting Selectric called the IBM Composer. It implemented proportional spacing and justification but cost too much.

Executives always knew that the right typewriter "look" presented on quality bond paper made a different impression than did a memo typed on cheap paper with a Royal upright typewriter that had a worn-out cloth ribbon.

I'm sure that if I'd had a Mac and a laser printer back in college, I would have received higher grades for the same work I did on my trusty portable typewriter. It may have been the same words, but those words would have been communicated differently. The brain sees it differently. Words aren't just words.

I use Macs as well as PCs and write for magazines about both machines, and I'm still amazed at how obvious it is which computer a person has used when I receive a letter. The Mac letters — even those printed with an ImageWriter — are immediately identifiable. PC users mostly use near-letter-quality dot-matrix printers, and some use daisywheel or non-PostScript laser printers. The impression you get is more than a few notches below what's conveyed by the usual laser-printed Times or Helvetica letters Mac users send.

But, with few exceptions, the Mac users stop about there. Few explore the subtleties and the psychology of the variety of fonts available — especially for the LaserWriter. This casual attitude permeates even the publishing business, where little thought is given to the typeface except by whining graphic artists. Most publications use about ten typefaces, and that's that.

Recently I was playing around with some essays I'd written (for a Dvorak bedside reader) and did about 50 versions of a single chapter before I got the look I wanted. I finally found a combination of typefaces that would put my readers into the right frame of mind. I realized that it would take a hard sell to convince a book publisher to use these faces and dimensions — otherwise the book would end up printed in the usual Bookman, Palatino, or Times.

With the advent of PostScript and inexpensive typefaces, there's no excuse for this. All you have to do is look at a software package to see how typefaces make an impression. Unfortunately, all the evidence is on the outside. The packaging is the only place in Mac software where the concept that a typeface is communication has been exploited. Advertising people stay ahead of the rest of us, because it's their job to manipulate public opinion. We should take the hint. You can be a few steps ahead of the competition once you understand that typefaces are more than window dressing.



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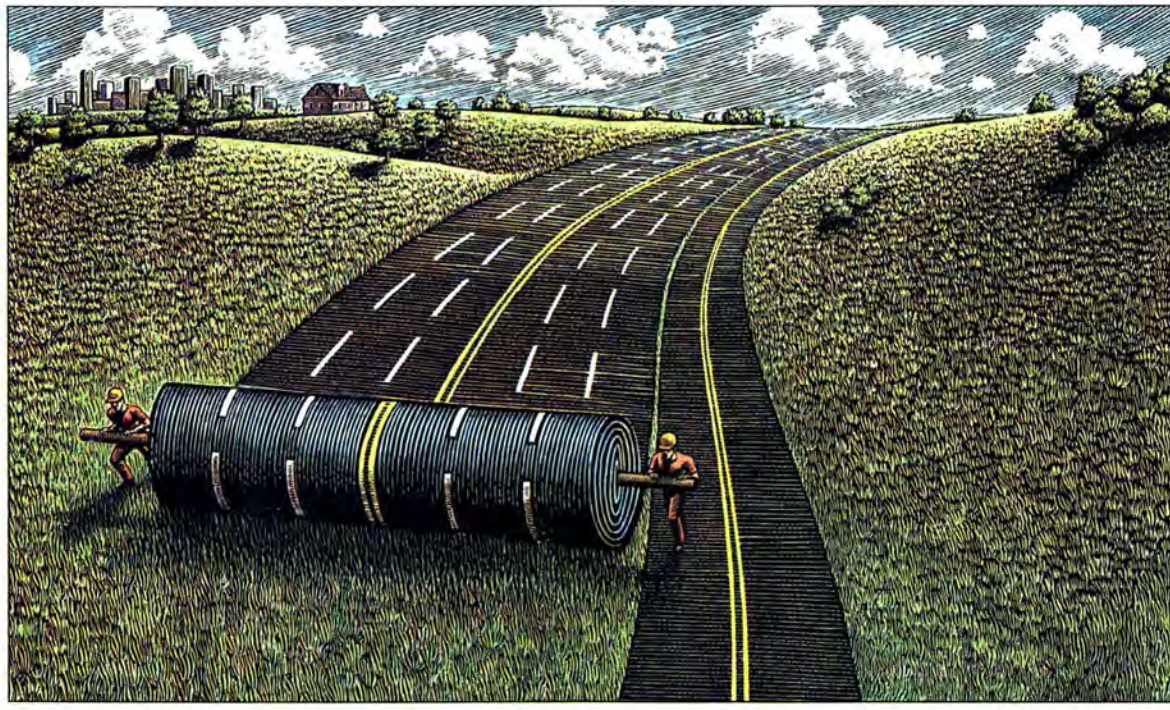
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